

# CATEGORICAL EXCLUSION LEVEL 1 FORM

Date: February 22, 2021

Initial Version

Additional Information to CE Level 1 Dated: \_\_\_\_\_

**Purpose of this document:**

CE Level 1 documentation for exempted projects

State-funded categorical exemption documentation

**Approval CE Level 1 or State-Funded CE:**

\_\_\_\_\_  
Environmental Scoping Manager or  
Environmental Policy Manager

\_\_\_\_\_  
Date

**Release for Public Involvement**

**Certification of Public Involvement**

ESM/ES Initials RF Date 2/26/2021

\_\_\_\_\_  
Office of Public Involvement Date

| PROJECT INFORMATION         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |         |
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| <b>County, Route</b>        | Knox County, United States (US) 41 and Elkhorn Road                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Des Number</b> | 1800224 |
| <b>Purpose and Need:</b>    | <p>The need for this project is a high crash rate at the intersection of US 41 with Elkhorn Road, just south of Vincennes in Knox County, Indiana. Crash data trends at this intersection indicate that it is approaching the threshold for classification as a “high crash” intersection. The existing intersection has 24 potential traffic conflict points, which contributes to the number and type of crash incidents. From 2016-2019, there were 15 crashes near the intersection, 53% of which resulted from a to failure to yield right of way. Additionally, 40% of the crashes were right-angle crashes or crashes involving a left-turn, which are more likely to result in injuries (Appendix I, pages 1-22).</p> <p>The purpose of the project is to improve safety at this location on US 41 by reducing the number of traffic conflict points, which will reduce the likelihood of crash incidents at this intersection.</p>                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |         |
| <b>Project Description:</b> | <p>The Indiana Department of Transportation (INDOT) and the Federal Highway Administration (FHWA) intend to proceed with an intersection improvement project at the intersection of US 41 and Elkhorn Road, approximately 1 mile south of the US 41 /Business 41 interchange in Knox County, Indiana. More specifically, the project is located in Section 17, Township 2 North, Range 10 West in Vincennes Township and in the Decker Quadrangle, as shown on the U.S. Geological Survey (USGS) 7.5 Minute Topographic Map (Appendix B, page 3).</p> <p>US 41 is a four-lane Rural Other Principal Arterial. The northbound approach to the intersection has a dedicated left-turn lane, one through lane, one shared through/right turn lane, and is separated from the southbound lanes by a 40-foot grass median. The southbound approach has a dedicated left turn lane, a dedicated right turn lane, and two through lanes. The posted speed on US 41 is 60 miles per hour (mph). US 41 crosses Mantle Ditch 600 feet south of the intersection.</p> <p>Elkhorn Road is a two-lane Rural Major Collector east of US 41 and a local road west of US 41. Both the eastbound and westbound approaches have a shared left turn/through lane/right turn lane. Primary land use in the area is a mix of residential, agricultural, and commercial. The US 41</p> |                   |         |

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|  | <p>Industrial Park is located in the southeast quadrant of the intersection and is currently partially occupied, with tenants including the INDOT Vincennes District main campus, a fire station, and multiple commercial manufacturing, warehouse, and office spaces. The business park is actively developing, and as the number of tenants increases, there has been an increase in traffic at the intersection that is projected to continue as the park grows.</p> <p>The intersection of US 41 with Elkhorn Road is unsignalized, with free-flowing north-south traffic on US 41 and stop controls at the east and west county road approaches. Traffic volume is heavier from the east approach on Elkhorn Road. The industrial park located in the southeast quadrant of the intersection contributes to the elevated traffic volume approaching the intersection from the east. Traffic forecasts for the area that show an expected increase in volume from the east approach specifically incorporated trips to and from the industrial park, which is still growing; traffic volume from the west approach is not expected to increase. The current configuration of the intersection leads to a high number of crashes. From 2016-2019, there were 15 crashes at the intersection, with 20% of those being right-angle crashes. Right-angle crashes are more likely to result in injuries. Of all reported crashes, 53% resulted from a failure to yield the right-of-way. Crash data trends indicate that indices of crash costs (<math>I_{CC}</math>) and crash frequency (<math>I_{CF}</math>) at this intersection are increasing, with some calculations already putting them over the threshold for classification as a “high crash” intersection, according to the Hazard Elimination Program Manual on Improving Safety of Indiana Road Intersections and Sections (Appendix I, pages 1-22).</p> <p>The preferred alternative will reconfigure the intersection of US 41 with Elkhorn Road by constructing a partial Reduced Conflict Intersection (RCI), as shown in Appendix B, pages 24-41. Westbound through traffic on Elkhorn Road will be directed to make a right onto US 41, then make a U-Turn across the US 41 median before making a right turn onto Elkhorn Road. Elkhorn Road west of US 41 will be modified to a right-in/right-out for US 41 southbound traffic. Construction activities will include the following:</p> <ul style="list-style-type: none"> <li>• Construction of a median U-Turn for northbound US 41 to the north of the intersection of US 41 and Elkhorn Road</li> <li>• Removal of the existing northbound left-turn lane at Elkhorn Road</li> <li>• Addition of a northbound right-turn lane from US 41 to Elkhorn Road</li> <li>• Construction of center curbs where Elkhorn Road intersects US 41</li> <li>• Removal of the existing underdrains and construction of new underdrains at the new outside pavement limit</li> <li>• Installation of new signage and street lighting</li> </ul> <p>The project area was initially developed to include to work on the US 41 bridges (Bridge Nos. 041-42-05077 BNBL and BSBL) over Mantle Ditch just south of Elkhorn Road. The bridge work was subsequently removed from the project due to funding concerns. The preliminary studies for this project, including the Red Flag Investigation (RFI) and the <i>Waters of the U.S. Determination / Wetland Delineation Report</i>, included a larger project area to encompass the potential work on the bridge.</p> <p>The Maintenance of Traffic (MOT) plan for this project will be accomplished in three phases utilizing lane closures. More information about the MOT can be found in the Public Facilities section of the document.</p> <p>The preferred alternative of a partial RCI intersection improvement meets the purpose and need of the project because it will eliminate through traffic on and left turning movements from Elkhorn Road. Eliminating through traffic and left turning movements will improve safety because it reduces the number of crossing conflict points. A conflict point is a location approaching or within an intersection where vehicle paths can either merge, diverge, or cross, which creates opportunities for crash incidents. Crossing conflict points occur when vehicles travelling along opposing movement paths can intersect, such as when a vehicle travelling from east to west crosses in front</p> |
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|                                       | <p>of a vehicle travelling north. In its current configuration, there are 24 potential crossing conflict points at the intersection. Constructing a partial RCI will reduce the number of crossing conflict points from 24 to 2.</p> <p>The project termini area logical because they are rational end points for an intersection improvement project and are of sufficient length to address environmental matters on a broad scale. This project has independent utility because it is a stand-alone project that will improve safety at this intersection, even if no other projects are completed.</p> <p>Every effort to avoid, minimize, and/or mitigate project impacts will be made.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                           |                                |                                 |                                 |
| <b>Other Alternatives Considered:</b> | <p><u>No-Build</u><br/>The No-Build alternative would make no physical changes to the existing intersection. This alternative would have no effect on environmental resources. Without improvements, the crash index at this intersection would likely increase to the level of the “high crash” designation and the risk of injury or fatality at this intersection would remain. The No-Build alternative was not selected because it fails to meet the purpose and need of the project.</p> <p><u>Full RCI Alternative</u><br/>This alternative would reconfigure the intersection of US 41 with Elkhorn road by constructing a full RCI. In a traditional full RCI, the median U-Turns are constructed 800 feet from the main intersection. The US 41 bridge over Mantle Ditch is located approximately 600 feet south of the intersection and accommodates 2 lanes of traffic. In order to accommodate the auxiliary lane approaching the southbound U-Turn, the southbound bridge would need to be widened towards the median. The northbound bridge would require widening towards the median to provide appropriate deceleration for the northbound left turn as well as to the east in order to extend the right-turn back to receive the U-Turn traffic and provide deceleration distance. This alternative meets the purpose and need of the project because it would improve safety at the intersection. The Full RCI Alternative was not selected because there is a substantial cost difference due to the requisite bridge work. The full RCI alternative would cost \$2.6 million more than the preferred, partial RCI alternative.</p> |                                           |                                |                                 |                                 |
| <b>Project Termini:</b>               | US 41 from 0.1 mile south of Elkhorn Road to 0.22 mile north of Elkhorn Road                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                |                                 |                                 |
| <b>Funding Source(s):</b>             | <input checked="" type="checkbox"/> Federal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> State | <input type="checkbox"/> Local | <input type="checkbox"/> Other  | <b>Estimated Cost</b> \$345,000 |
| <b>Project Sponsor:</b>               | INDOT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                           |                                | <b>Project Length</b> 0.32 mile |                                 |

Name and organization of CE Level 1 Preparer: Susan Harrington, HNTB

INDOT ES/District Env. Reviewer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

| <b>SCOPE OF THE PROPOSED ACTION</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |           |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|
| <b>Public Involvement*</b>          | No:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Yes: <b>X</b> | Possible: |
| <b>Comments:</b>                    | <p>Notice of Entry letters were not required for this project because all proposed work will occur within the exiting right-of-way (ROW).</p> <p>INDOT will offer the public an opportunity to submit comment and/or request a public hearing. Therefore, a legal notice will appear in a local publication contingent upon the release of this document for public involvement. This document will be revised after the public involvement requirements are fulfilled. In addition, due to INDOT’s desire to educate the public on how to navigate a “Median U-Turn” intersection,</p> |               |           |

| <b>SCOPE OF THE PROPOSED ACTION</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          |                                    |
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| a public information meeting will be held for the general public prior to the project letting. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          |                                    |
| <b>Right-of-way (permanent and temporary, in acres)</b>                                        | No: <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes: <input type="checkbox"/>            | Possible: <input type="checkbox"/> |
| Comments:                                                                                      | <p>Existing ROW in this area of US 41 averages approximately 120-130 feet west and approximately 135-140 feet east of the centerline of US 41. This area consists of mowed and maintained ROW.</p> <p>This project will occur within existing ROW. No permanent or temporary ROW will be required for this project.</p> <p>If the scope of work or permanent or temporary right-of-way amounts change, the INDOT Environmental Services Division (ESD) and the INDOT District Environmental Section will be contacted immediately.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                    |
| <b>Disruption to public facilities/services (such as schools, emergency service)</b>           | No: <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes: <input checked="" type="checkbox"/> | Possible: <input type="checkbox"/> |
| Comments:                                                                                      | <p>Based on a desktop review, a site visit on April 9, 2020 by HNTB, the aerial map of the project area (Appendix B, page 2), and the RFI report (Appendix E, pages 1-13), there are no public facilities located within 0.5 mile of the project. There are no public facilities within or adjacent to the project area. Access to all properties will be maintained during construction; therefore, no impacts are expected.</p> <p>Early coordination letters were sent to the Knox County Surveyor, Knox County Sheriff, Knox County Highway Department, Knox County Council, Knox County Board of Commissioners, Vincennes Township Fire Department, and the Floodplain Administrator on August 6, 2020. These agencies did not respond to early coordination letters.</p> <p>The MOT plan for this project will require closure of one lane for both northbound and southbound traffic on US 41 (Appendix B, pages 29-34). One lane in each direction will remain open during construction. A temporary closure of the east approach of Elkhorn Road would be utilized to construct the center curb at the intersection with US 41. Local traffic will have access to US 41 at the Decker Road interchanges to the north and the Industrial Park Boulevard intersection to the south.</p> <p>The closures/lane restrictions will pose a temporary inconvenience to traveling motorists (including school buses and emergency services); however, no significant delays are anticipated and all inconveniences will cease upon project completion.</p> <p>It is the responsibility of the project sponsor to notify school corporations and emergency services at least two weeks prior to any construction that would block or limit access.</p> |                                          |                                    |
| <b>Involvement with existing bridge(s) (Include structure number(s))</b>                       | No: <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes: <input type="checkbox"/>            | Possible: <input type="checkbox"/> |
| Comments:                                                                                      | <p>There are two 12-inch reinforced concrete pipes (RCPs) and one 12-inch high-density polyethylene pipe within the project area. No work will occur on the 12-inch HDPE pipe. The two 12-inch RCP pipes will remain in place, but the existing field inlet will be removed. The new proposed field inlet will consist of a 6-foot pipe that will tie into the existing drainage structures.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                          |                                    |

*\* Limited public involvement, CE-1 level projects will typically have no public hearing opportunity offered.*

| <b>INVOLVEMENT WITH RESOURCES</b>                               |                                                                                                                                                                                                                                                                                                                              |                               |                                    |
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| <b>Streams, Rivers, and Watercourses Impacted (linear feet)</b> | No: <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                      | Yes: <input type="checkbox"/> | Possible: <input type="checkbox"/> |
| Comments:                                                       | <p>Based on a desktop review, a site visit on April 9, 2020 by HNTB, the aerial map of the project area (Appendix B, page 2), and the water resources map in the RFI report (Appendix E, pages 1-13), there are two streams and eight lakes located within the 0.5 mile search radius. There is one stream mapped within</p> |                               |                                    |

**INVOLVEMENT WITH RESOURCES**

or adjacent to the project area.

A *Waters of the U.S. Determination / Wetland Delineation Report* was approved by the INDOT Ecology and Waterway Permitting Office on September 22, 2020. Please refer to Appendix F, pages 1-10 for the *Waters of the U.S. Determination / Wetland Delineation Report*. It was determined that three likely jurisdictional features were within the identified investigated area. (Please note that the investigated area for the waters investigation was larger than the final construction limits for the preferred alternative.) Unnamed Tributary (UNT)-1 to Mantle Ditch, UNT-2 to Mantle Ditch, and Mantle Ditch are likely waters of the U.S. with hydrologic connectivity to the Wabash River, a traditionally navigable waterway (TNW). Three roadside ditches were identified within the survey area. None of the roadside ditches were observed to contain an ordinary high water mark (OHWM) and were thus concluded to likely be non-jurisdictional features. The U.S. Army Corps of Engineers (USACE) makes all final determinations regarding jurisdiction.

The following stream features were delineated during the investigation:

- UNT-1 to Mantle Ditch: an ephemeral stream feature that exhibited an OHWM during the site visit of 1.83 feet wide by 0.25 feet deep.
- UNT-2 to Mantle Ditch: an ephemeral stream feature that exhibited an OHWM during the site visit of 4 feet wide by 0.92 feet deep.
- Mantle Ditch: a perennial stream feature that exhibited an OHWM during the site visit of 25 feet wide by 2.5 feet deep.

Both Mantle Ditch and UNT-2 to Mantle Ditch are entirely outside of the current construction limits. No impacts are expected. Although a portion of UNT-1 to Mantle Ditch is encompassed by the current construction limits, UNT-1 to Mantle Ditch will not be impacted by the project.

Early coordination letters were sent on August 6, 2020 (Appendix C, pages 1-2). The United States Fish and Wildlife Service (USFWS) responded on August 25, 2020, with recommendations to avoid or minimize impacts to streams (Appendix C, pages 4-5). These recommendations pertained to erosion and sediment control measures, bank stabilization, minimization of in-stream channel work, and evaluation of wildlife crossings.

The Indiana Department of Natural Resources Division of Fish and Wildlife responded on September 4, 2020, with recommendations to avoid or minimize impacts to streams (Appendix C, pages 16-17). These recommendations pertained to revegetating disturbed areas with a mixture of grasses and legumes and to erosion and sediment control measures.

An automated letter was generated from IDEM's website on September 14, 2020 (Appendix C, pages 9-15). This letter contains recommendations pertaining to storm water quality measures to be implemented during construction and coordination with appropriate permitting agencies.

All applicable USFWS and IDNR DFW recommendations are included in the Environmental Commitments section of this CE document.

|                         |              |      |           |
|-------------------------|--------------|------|-----------|
| <b>Wetlands (acres)</b> | No: <b>X</b> | Yes: | Possible: |
|-------------------------|--------------|------|-----------|

**Comments:** Based on a review of the National Wetlands Inventory (NWI) online mapper (<https://www.fws.gov/wetlands/data/Mapper.html>), a site visit on April 9, 2020 by HNTB, the USGS topographic map (Appendix B, page 3), and the RFI report (Appendix E, pages 1-13) there are thirteen wetlands located within the 0.5 mile search radius. No wetlands are present within or adjacent to the project area, therefore, no impacts are expected.

A *Waters of the U.S. Determination / Wetland Delineation Report* was approved by INDOT Ecology and Waterway Permitting on September 22, 2020. Please refer to Appendix F, pages 1-10 for the *Waters of the U.S. Determination / Wetland Delineation Report*. No wetlands were observed within the investigated

| <b>INVOLVEMENT WITH RESOURCES</b>                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |                                          |
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|                                                   | <p>area.</p> <p>The USFWS early coordination response dated August 25, 2020 did not provide recommendations pertaining to wetlands (Appendix C, pages 4-5).</p> <p>The IDNR DFW early coordination response dated September 4, 2020 did not provide recommendations pertaining to wetlands (Appendix C, pages 16-17).</p> <p>An automated letter was generated from IDEM’s website on September 14, 2020 (Appendix C, pages 9-15). This letter contains recommendations regarding proper permits.</p> <p>All applicable USFWS and IDNR DFW recommendations are included in the Environmental Commitments section of this CE document.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |                                          |
| <b>Disturbance of Terrestrial Habitat (acres)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No:                                     | Yes: <input checked="" type="checkbox"/> |
|                                                   | Possible:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |                                          |
| Comments:                                         | <p>Based on a desktop review, a site visit on April 9, 2020 by HNTB, and the aerial map of the project area (Appendix B, page 2), there is primarily maintained state highway ROW habitat within the project area. Vegetation within the proposed construction limits is dominated by tall fescue.</p> <p>No tree clearing will be necessary for the proposed intersection improvement project. Approximately 1.7 acres of terrestrial habitat within the US 41 right-of-way will be impacted by the project. Due to the additional pavement to be installed in the vegetated median required for the U-turns, disturbance to terrestrial habitat is unavoidable. The project includes the construction of a “Median U-Turn” to restrict east and west left turn movements by channeling/directing the traffic through the median by using raised islands. All construction activities will occur within the existing right-of-way. All disturbed areas will be restored per current INDOT Standard Specifications. Mitigation for terrestrial impacts is not anticipated.</p> <p>USFWS responded to early coordination on August 25, 2020 with recommendations to avoid or minimize impacts to terrestrial habitat (Appendix C, pages 4-5). These recommendations included limiting tree clearing and understory vegetation to within the construction zone boundaries, as well as implementing temporary erosion and sediment control methods within areas of disturbed soil.</p> <p>IDNR DFW responded on September 4, 2020 with recommendations to avoid or minimize impacts to terrestrial habitat (Appendix C, pages 16-17). These recommendations included post-construction revegetation measures and clearing restriction of any trees suitable for the Indiana bat or Northern Long-eared bat roosting during the active season.</p> <p>An automated letter was generated from IDEM’s website on September 14, 2020 (Appendix C, pages 9-15). This letter contains recommendations pertaining to permitting requirements and restrictions regarding disturbance of vegetation.</p> <p>All applicable USFWS and IDNR DFW recommendations are included in the Environmental Commitments section of this CE document.</p> |                                         |                                          |
| <b>Karst Features</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No: <input checked="" type="checkbox"/> | Yes:                                     |
|                                                   | Possible:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |                                          |
| Comments:                                         | <p>Based on a desktop review, the project is located outside the designated karst region of Indiana as outlined in the October 13, 1993 Memorandum of Understanding (MOU). According to the topo map of the project area (Appendix B, page 3), and the RFI report (Appendix E, pages 1-13), there are no karst features identified within or adjacent to the project area. In the early coordination response, the Indiana Geological Survey (IGS) did not indicate that karst features exist in the project area (Appendix C, pages 6-8). The IGS response indicated that there is a 1% annual chance flood hazard, a moderate liquefaction potential, low potential for bedrock resources, a high potential for sand and gravel resources, and that there are no active or abandoned mineral resource extraction sites mines documented within 0.5 mile of the project area.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                         |                                          |

| <b>INVOLVEMENT WITH RESOURCES</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |                    |
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|                                          | Response from IGS has been communicated with the designer on September 16, 2020. No impacts are expected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |                    |
| <b>Threatened and Endangered Species</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No:          | Yes:               |
|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              | Possible: <b>X</b> |
| Comments:                                | <p>Based on a desktop review and the RFI report (Appendix E, pages 1-13), completed by HNTB on July 10, 2020, the IDNR Knox County Endangered, Threatened and Rare (ETR) Species List has been checked and is included in Appendix E (pages 11-13). The highlighted species on the list reflect the federal and state identified ETR species located within the county. According to the IDNR-DFW early coordination response letter dated September 4, 2020 (Appendix C, pages 16-17), the Natural Heritage Program's Database has been checked and to date, the banded pygmy sunfish (<i>Elassoma zonatrum</i>), a state species of special concern, has been documented in Mantle Ditch within 0.5 mile of the project area. IDNR DFW indicated that as long as standard erosion control measures are implemented near Mantle Ditch along the southernmost portion of the project area, no impacts are expected.</p> <p>Project information was submitted through the USFWS's Information for Planning and Consultation (IPaC) portal, and an official species list was generated (Appendix C, page 21-26). The project is within range of the federally endangered Indiana bat (<i>Myotis sodalis</i>) and the federally threatened northern long-eared bat (NLEB) (<i>Myotis septentrionalis</i>). No additional species were found within or adjacent to the project area other than the Indiana bat and the northern long-eared bat.</p> <p>The project qualifies for the <i>Range-wide Programmatic Informal Consultation for the Indiana bat and northern long-eared bat (NLEB)</i>, dated May 2016 (revised February 2018), between FHWA, Federal Railroad Administration (FRA), Federal Transit Administration (FTA), and USFWS. An effect determination key was completed on September 1, 2020, and based on the responses provided, the project was found to "may affect – not likely to adversely affect" the Indiana bat and/or the NLEB. INDOT reviewed and verified the effect finding on September 3, 2020 and requested USFWS's review of the finding (Appendix C, pages 27-36). No response was received from USFWS within the 14-day review period; therefore, it was concluded they concur with the finding. Avoidance and Minimization Measures (AMMs) are included as firm commitments in the Environmental Commitments section of this document.</p> <p>This precludes the need for further consultation on this project as required under Section 7 of the Endangered Species Act, as amended. If new information on endangered species at the site becomes available, or if project plans are changed, USFWS will be contacted for consultation.</p> |              |                    |
| <b>Drinking Water Resources</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No: <b>X</b> | Yes:               |
|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              | Possible:          |
| Comments:                                | <p>The project is located in Knox County, which is not located within the area of the St. Joseph Sole Source Aquifer, the only legally designated sole source aquifer in the state of Indiana. Therefore, the FHWA/EPA Sole Source Aquifer Memorandum of Understanding (MOU) is not applicable to this project. Therefore, a detailed groundwater assessment is not needed and no impacts are expected.</p> <p>The Indiana Department of Environmental Management's Wellhead Proximity Determinator website (<a href="http://www.in.gov/idem/cleanwater/pages/wellhead/">http://www.in.gov/idem/cleanwater/pages/wellhead/</a>) was accessed on September 9, 2020 by HNTB. This project is not located within a Wellhead Protection Area or Source Water Area. No impacts are expected.</p> <p>The Indiana Department of Natural Resources Water Well Record Database website (<a href="https://www.in.gov/dnr/water/3595.htm">https://www.in.gov/dnr/water/3595.htm</a>) was accessed on September 9, 2020 by HNTB. Two water wells are located near the western edge of the project area on Elkhorn Road. These features will not be affected because they are both on private property outside of the construction limits. Therefore, no impacts are expected. Should it be determined during the right-of-way phase that these wells are affected, a cost to cure will likely be included in the appraisal to restore the wells.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                    |

| <b>INVOLVEMENT WITH RESOURCES</b>                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                              |                                                    |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------|
|                                                              | <p>Based on a desktop review of the INDOT MS4 website (<a href="https://entapps.indot.in.gov/MS4/">https://entapps.indot.in.gov/MS4/</a>) by HNTB on September 9, 2020 and the RFI report, the northwestern portion of this project is located within an Urban Area Boundary (UAB). An early coordination letter was sent on August 6, 2020 (Appendix C, pages 1-2). The Vincennes MS4 Coordinator responded on August 7, 2020, stating that the project is outside of the MS4 jurisdiction (Appendix C, page 18). No impacts are expected.</p> <p>Based on a desktop review, a site visit on April 9, 2020 by HNTB, the aerial map of the project area (Appendix B, page 2), and the IDEM Indiana Public Water Supply Database website (<a href="https://myweb.in.gov/IDEM/DWW/">https://myweb.in.gov/IDEM/DWW/</a>), this project is located where there is a public water system. The public water system will not be affected because the project will not require deep excavation. A utility coordination letter was sent on date July 17, 2020 to the City Vincennes (Appendix C, page 20). No response was received.</p> |                                              |                                                    |
| <b>Flood Plains (note transverse or longitudinal impact)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No:                                          | Yes: <input checked="" type="checkbox"/> Possible: |
| Comments:                                                    | <p>Based on a desktop review of The Indiana Department of Natural Resources Indiana Floodway Information Portal website (<a href="http://dnrmmaps.dnr.in.gov/appsphp/fdms/">http://dnrmmaps.dnr.in.gov/appsphp/fdms/</a>) by HNTB on August 27, 2020, this project is located in a regulatory floodplain as determined from approved IDNR floodplain maps (Appendix B, page 4). An early coordination letter was sent on August 6, 2020 to the Knox County Floodplain Administrator (Appendix C, pages 1-2). The floodplain administrator did not respond within the 30-day time frame. This project qualifies as a Category 1, per the current INDOT CE Manual, which states that although this project involves work within the horizontal limits of the 100-year floodplain, no work is being performed below the 100-year flood elevation and as a result, this project does not encroach upon the base floodplain.</p>                                                                                                                                                                                                     |                                              |                                                    |
| <b>Farmland (acres)</b>                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No: <input checked="" type="checkbox"/> Yes: | Possible:                                          |
| Comments:                                                    | <p>Based on a desktop review, a site visit on April 9, 2020 by HNTB and the aerial map of the project area (Appendix B, page 2), there is no land that meets the definition of farmland under the Farmland Protection Policy Act (FPPA) within the project area. There is land that meets the definition of farmland under the Farmland Protection Act adjacent to the project; however, this project will occur within existing right of way and no coordination with the Natural Resources Conservation Services (NRCS) is required. No alternatives other than those previously discussed in this document will be investigated without reevaluating impacts to prime farmland. No impacts are expected.</p>                                                                                                                                                                                                                                                                                                                                                                                                                 |                                              |                                                    |
| <b>Cultural Resources</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No: <input checked="" type="checkbox"/> Yes: | Possible:                                          |
| Comments:                                                    | <p>On June 25, 2020, HNTB determined that this project falls within the guidelines of Category A, Type A-2 and Type A-5 under the Minor Projects Programmatic Agreement, (Appendix D, page 1). MPPA Category A-2 projects include all work within interchanges and within medians of divided highways in previously disturbed soils. MPPA Category Type A-5 projects include repair, in-kind replacement or upgrade of existing lighting, signals, signage, and other traffic control devices in previously disturbed soils. No further consultation is required. This completes the Section 106 process and the responsibilities of the FHWA under Section 106 have been fulfilled.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                              |                                                    |

| <b>INVOLVEMENT WITH RESOURCES</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |                                    |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------|
| <b>Section 4(f) and Section 6(f) Resources</b> | No: <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Yes: <input type="checkbox"/> | Possible: <input type="checkbox"/> |
| <b>Comments:</b>                               | <p>Section 4(f) of the U.S. Department of Transportation Act of 1966 prohibits the use of certain public and historic lands for federally funded transportation facilities unless there is no feasible and prudent alternative. The law applies to significant publicly owned parks, recreation areas, wildlife / waterfowl refuges, and NRHP eligible or listed historic properties regardless of ownership. Lands subject to this law are considered Section 4(f) resources.</p> <p>Based on a desktop review, a site visit on April 9, 2020 by HNTB, the aerial map of the project area (Appendix B, page 2), the Indiana State Historic Architectural and Archaeological Research Database, and the RFI report (Appendix E, pages 1-13) there is one potential 4(f) resource located within the 0.5 mile search radius. There are no Section 4(f) resources within or adjacent to the project area. Therefore, no use is expected.</p> <p>The U.S. Land and Water Conservation Fund Act of 1965 established the Land and Water Conservation Fund (LWCF), which was created to preserve, develop, and assure accessibility to outdoor recreation resources. Section 6(f) of this Act prohibits conversion of lands purchased with LWCF monies to a non-recreation use.</p> <p>A review of 6(f) properties on the LWCF list maintained by the IDNR Division of Outdoor Recreation for the identification of LWCF properties and provided by INDOT ESD revealed a total of 4 properties in Knox County (Appendix I, page 42). None of these properties are located within or adjacent to the project area. Therefore, there will be no impacts to 6(f) resources as a result of this project.</p> |                               |                                    |
| <b>Air Quality Impacts</b>                     | No: <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Yes: <input type="checkbox"/> | Possible: <input type="checkbox"/> |
| <b>Comments:</b>                               | <p>This project is included in the Fiscal Year (FY) 2020-2024 Statewide Transportation Improvement Program (STIP) (Appendix H, page 1).</p> <p>This project is located in Knox County, which is currently in attainment for all criteria pollutants according to the IDEM Office of Air Quality. Therefore, the conformity procedures of 40 CFR Part 93 do not apply.</p> <p>This project is of a type qualifying as a categorical exclusion (Group 1) under 23 CFR 771.117(c), or exempt under the Clean Air Act conformity rule under 40 CFR 93.126, and as such, a Mobile Source Air Toxics analysis is not required.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                               |                                    |
| <b>Community/Economic Impacts</b>              | No: <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Yes: <input type="checkbox"/> | Possible: <input type="checkbox"/> |
| <b>Comments:</b>                               | <p>Indirect impacts are effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate. Cumulative impacts affect the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions.</p> <p>This project is not of a type that is likely to cause substantial indirect or cumulative impacts. This intersection improvement project is not expected to affect growth, changes in land use, or population density. The project will not add capacity to the existing roadway network or provide additional access to any currently undeveloped area. The project is not anticipated to impact the tax base for the area or result in negative impacts to community cohesion. Therefore, the project is not expected to increase development in the area or result in substantial indirect or cumulative impacts.</p> <p>Under FHWA Order 6640.23A, FHWA and the project sponsor, as a recipient of funding from FHWA, are</p>                                                                                                                                                                                                                                                                                                                                                                                    |                               |                                    |

| <b>INVOLVEMENT WITH RESOURCES</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         |                                                                             |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------|
|                                   | <p>responsible to ensure that their programs, policies, and activities do not have a disproportionately high and adverse effect on minority or low-income populations. This project will have no relocations and will require less than 0.5 acre of additional permanent right-of-way; therefore, an EJ analysis is not required per the current INDOT Categorical Exclusion Manual.</p> <p>There are no long-term, foreseeable economic impacts from the project. Per the Indiana Festival website (<a href="http://www.indianafestivals.org">www.indianafestivals.org</a>), accessed on June 18, 2020, there are numerous regularly scheduled festivals in Vincennes, Indiana. Festivals include Olde Post Bluegrass Jam, Red Skelton Festival, Spirit of Vincennes Rendezvous, Salute to Veterans of WWII, and Christmas at Grouseland. The MOT plan will allow for traffic to travel in each direction and remain open throughout the duration of construction activities; therefore, the project is not expected to cause significant delays or inconveniences to those traveling to these events. The selected contractor will implement the MOT plan in accordance with the current Indiana Design Manual (IDM) and INDOT Standard Specifications.</p>                                                                                                                                             |                                         |                                                                             |
| <b>Hazardous Materials</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No: <input checked="" type="checkbox"/> | Yes: <input type="checkbox"/> Possible: <input type="checkbox"/>            |
| Comments:                         | <p>Based on a review of GIS and available public records, an RFI was approved on July 13, 2020 by INDOT ESD, Site Assessment and Management (Appendix E, Pages 1-13). Eight sites with hazardous material concerns (hazmat sites) or sites involved with regulated substances were identified within 0.5 mile of the project area, and one site is located adjacent to the project area; however, no hazmat sites were identified in or within 0.5 mile of the project area that will impact the project.</p> <p>The nearest Resource Conservation and Recovery Act (RCRA) Generator/Treatment, Storage and Disposal (TSD) site is mapped 0.43 mile from the project area. The nearest Underground Storage Tank (UST) site is mapped 0.43 mile from the project area. The nearest NPDES Facility is located adjacent to the project area. An early coordination letter was sent to Toth Enterprises of Indiana, LLC. on September 10, 2020 (Appendix C, pages 1-2). No response was received. No impacts are expected. The project termini for this intersection improvement are sufficient to avoid the hazardous material location. All work will be done within existing INDOT ROW. No further investigation for hazardous materials is required at this time, as IDEM issued permits are in place for the existing hazmat site and early coordination was done with the owner of the hazmat site.</p> |                                         |                                                                             |
| <b>Permits</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No: <input type="checkbox"/>            | Yes: <input checked="" type="checkbox"/> Possible: <input type="checkbox"/> |
| Comments:                         | <p>An IDEM Rule 5 Notice of Intent permit will likely be required for this project.</p> <p>Applicable recommendations provided by USFWS and IDNR DFW are included in the Environmental Commitments section of this document. If permits are found to be necessary, the conditions of the permit will be requirements of the project and will supersede these recommendations.</p> <p>It is the responsibility of the project sponsor to identify and obtain all required permits.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                             |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ENVIRONMENTAL COMMITMENTS:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b><u>FIRM</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <ol style="list-style-type: none"> <li>1) If the scope of work or permanent or temporary right-of-way amounts change, the INDOT Environmental Services Division (ESD) and the INDOT District Environmental Section will be contacted immediately. (INDOT ESD and INDOT District)</li> <li>2) It is the responsibility of the project sponsor to notify school corporations and emergency services at least two weeks prior to any construction that would block or limit access. (INDOT ESD)</li> <li>3) General AMM 1: Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs. (USFWS)</li> <li>4) Lighting AMM 1. Direct temporary lighting away from suitable habitat during the active season. (USFWS)</li> <li>5) Lighting AMM 2. When installing new or replacing existing permanent lights, use downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting); or for those transportation agencies using the BUG system developed by the Illuminating Engineering Society, be as close to 0 for all three ratings with a priority of "uplight" of 0 and "backlight" as low as practicable. (USFWS)</li> </ol> |

| <b>THE CATEGORICAL EXCLUSION CANNOT BE PROCESSED AS A LEVEL ONE IF YES IS SELECTED FOR ANY OF THE FOLLOWING ITEMS*:</b>   |              |      |
|---------------------------------------------------------------------------------------------------------------------------|--------------|------|
| <b>Formal noise analysis required?</b>                                                                                    | No: <b>X</b> | Yes: |
| <b>Environmental Justice analysis required?</b>                                                                           | No: <b>X</b> | Yes: |
| <b>Right-of-Way acquisition greater than 0.5 acre?</b>                                                                    | No: <b>X</b> | Yes: |
| <b>Relocation of residences/businesses/etc.?</b>                                                                          | No: <b>X</b> | Yes: |
| <b>Added through-traffic lanes?</b>                                                                                       | No: <b>X</b> | Yes: |
| <b>Facility on new location or realignment?</b>                                                                           | No: <b>X</b> | Yes: |
| <b>Permanent alteration of local traffic pattern?</b>                                                                     | No: <b>X</b> | Yes: |
| <b>Section 4(f) and Section 6(f) resource impacts?</b>                                                                    | No: <b>X</b> | Yes: |
| <b>Sole Source Aquifer Groundwater Assessment required?</b>                                                               | No: <b>X</b> | Yes: |
| <b>Is the project "Likely to Adversely Affect" Threatened and Endangered Species?</b>                                     | No: <b>X</b> | Yes: |
| <b>Stream impacts greater than 300 linear feet, or work beyond 75 feet from pavement?</b>                                 | No: <b>X</b> | Yes: |
| <b>Wetland impacts greater than 0.1 acre?</b>                                                                             | No: <b>X</b> | Yes: |
| <b>Does the project have historic bridge involvement, or a Section 106 finding of No Adverse Effect / Adverse Effect?</b> | No: <b>X</b> | Yes: |

\* Please note, this table is not applicable for state funded CE's.

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## APPENDIX A: INDOT SUPPORTING DOCUMENTATION

## Categorical Exclusion Level Thresholds

|                                                                                                                                                         | PCE                                                                                                                            | Level 1                                                | Level 2                             | Level 3                      | Level 4 <sup>1</sup>                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------|------------------------------|--------------------------------------------------------------|
| <b>Section 106</b>                                                                                                                                      | Falls within guidelines of Minor Projects PA                                                                                   | “No Historic Properties Affected”                      | “No Adverse Effect”                 | -                            | “Adverse Effect” Or Historic Bridge involvement <sup>2</sup> |
| <b>Stream Impacts</b>                                                                                                                                   | No construction in waterways or water bodies                                                                                   | < 300 linear feet of stream impacts                    | ≥ 300 linear feet of stream impacts | -                            | Individual 404 Permit                                        |
| <b>Wetland Impacts</b>                                                                                                                                  | No adverse impacts to wetlands                                                                                                 | < 0.1 acre                                             | -                                   | < 1 acre                     | ≥ 1 acre                                                     |
| <b>Right-of-way<sup>3</sup></b>                                                                                                                         | Property acquisition for preservation only or none                                                                             | < 0.5 acre                                             | ≥ 0.5 acre                          | -                            | -                                                            |
| <b>Relocations</b>                                                                                                                                      | None                                                                                                                           | -                                                      | -                                   | < 5                          | ≥ 5                                                          |
| <b>Threatened/Endangered Species (Species Specific Programmatic for Indiana bat &amp; northern long eared bat)</b>                                      | “No Effect”, “Not likely to Adversely Affect” (Without AMMs <sup>4</sup> or with AMMs required for all projects <sup>5</sup> ) | “Not likely to Adversely Affect” (With any other AMMs) | -                                   | “Likely to Adversely Affect” | Project does not fall under Species Specific Programmatic    |
| <b>Threatened/Endangered Species (Any other species)</b>                                                                                                | Falls within guidelines of USFWS 2013 Interim Policy                                                                           | “No Effect”, “Not likely to Adversely Affect”          | -                                   | -                            | “Likely to Adversely Affect”                                 |
| <b>Environmental Justice</b>                                                                                                                            | No disproportionately high and adverse impacts                                                                                 | -                                                      | -                                   | -                            | Potential <sup>6</sup>                                       |
| <b>Sole Source Aquifer</b>                                                                                                                              | Detailed Assessment Not Required                                                                                               | -                                                      | -                                   | -                            | Detailed Assessment                                          |
| <b>Floodplain</b>                                                                                                                                       | No Substantial Impacts                                                                                                         | -                                                      | -                                   | -                            | Substantial Impacts                                          |
| <b>Coastal Zone Consistency</b>                                                                                                                         | Consistent                                                                                                                     | -                                                      | -                                   | -                            | Not Consistent                                               |
| <b>National Wild and Scenic River</b>                                                                                                                   | Not Present                                                                                                                    | -                                                      | -                                   | -                            | Present                                                      |
| <b>New Alignment</b>                                                                                                                                    | None                                                                                                                           | -                                                      | -                                   | -                            | Any                                                          |
| <b>Section 4(f) Impacts</b>                                                                                                                             | None                                                                                                                           | -                                                      | -                                   | -                            | Any                                                          |
| <b>Section 6(f) Impacts</b>                                                                                                                             | None                                                                                                                           | -                                                      | -                                   | -                            | Any                                                          |
| <b>Added Through Lane</b>                                                                                                                               | None                                                                                                                           | -                                                      | -                                   | -                            | Any                                                          |
| <b>Permanent Traffic Alteration</b>                                                                                                                     | None                                                                                                                           | -                                                      | -                                   | -                            | Any                                                          |
| <b>Coast Guard Permit</b>                                                                                                                               | None                                                                                                                           | -                                                      | -                                   | -                            | Any                                                          |
| <b>Noise Analysis Required</b>                                                                                                                          | No                                                                                                                             | -                                                      | -                                   | -                            | Yes                                                          |
| <b>Air Quality Analysis Required</b>                                                                                                                    | No                                                                                                                             | -                                                      | -                                   | -                            | Yes <sup>7</sup>                                             |
| <b>Approval Level</b><br><ul style="list-style-type: none"> <li>• District Env. Supervisor</li> <li>• Env. Services Division</li> <li>• FHWA</li> </ul> | Concurrence by INDOT District Environmental or Environmental Services                                                          | Yes                                                    | Yes                                 | Yes<br>Yes                   | Yes<br>Yes<br>Yes                                            |

<sup>1</sup>Coordinate with INDOT Environmental Services. INDOT will then coordinate with the appropriate FHWA Environmental Specialist.

<sup>2</sup>Any involvement with a bridge processed under the Historic Bridge Programmatic Agreement.

<sup>3</sup>Permanent and/or temporary right-of-way.

<sup>4</sup>AMMs = Avoidance and Mitigation Measures.

<sup>5</sup>AMMs determined by the IPAC decision key to be needed that are listed in the USFWS *User's Guide for the Range-wide Programmatic Consultation for Indiana bat and Northern long-eared bat* as “required for all projects”.

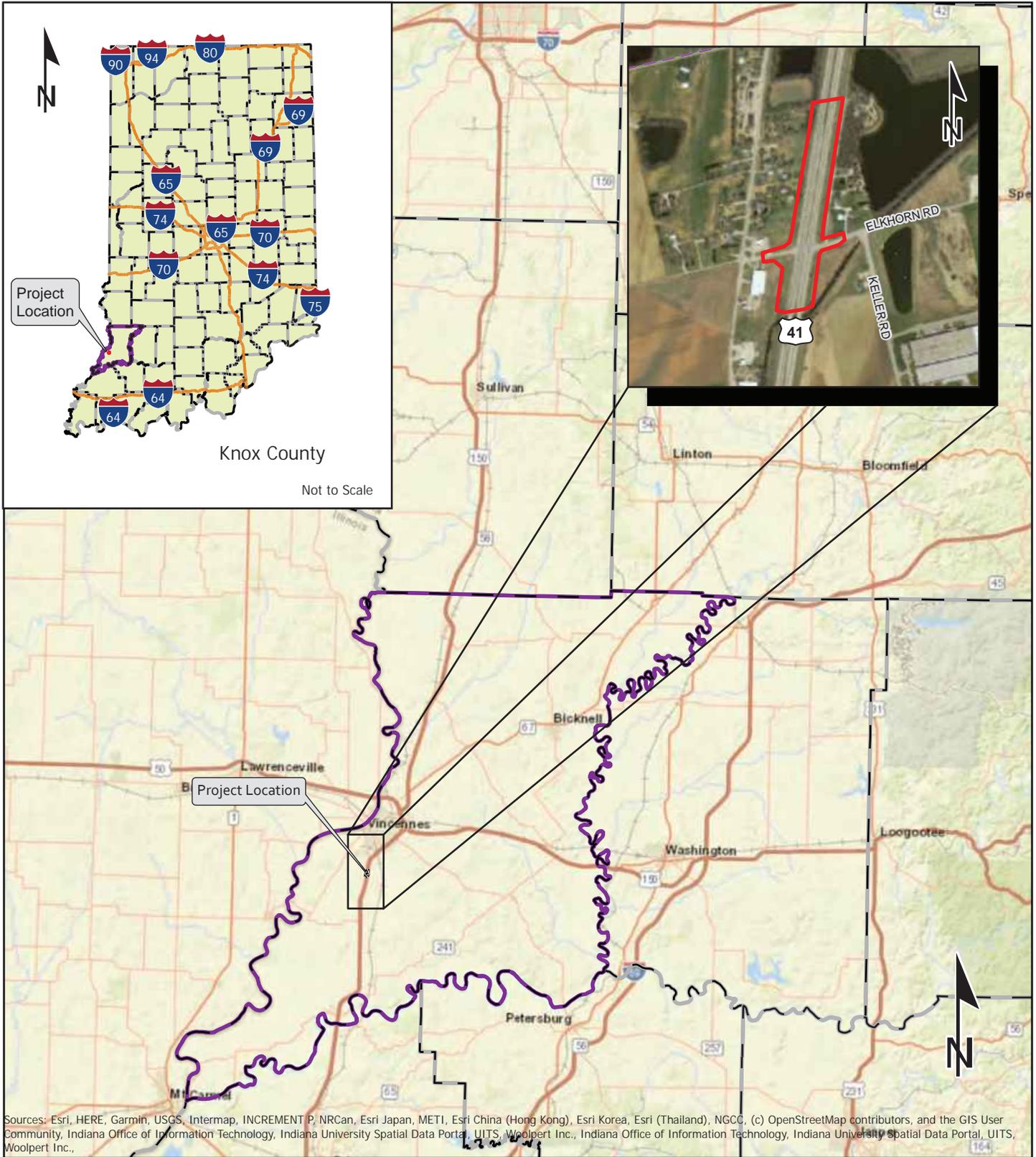
<sup>6</sup>Potential for causing a disproportionately high and adverse impact.

<sup>7</sup>Hot Spot Analysis and/or MSAT Quantitative Emission Analysis.

\*Substantial public or agency controversy may require a higher-level NEPA document.

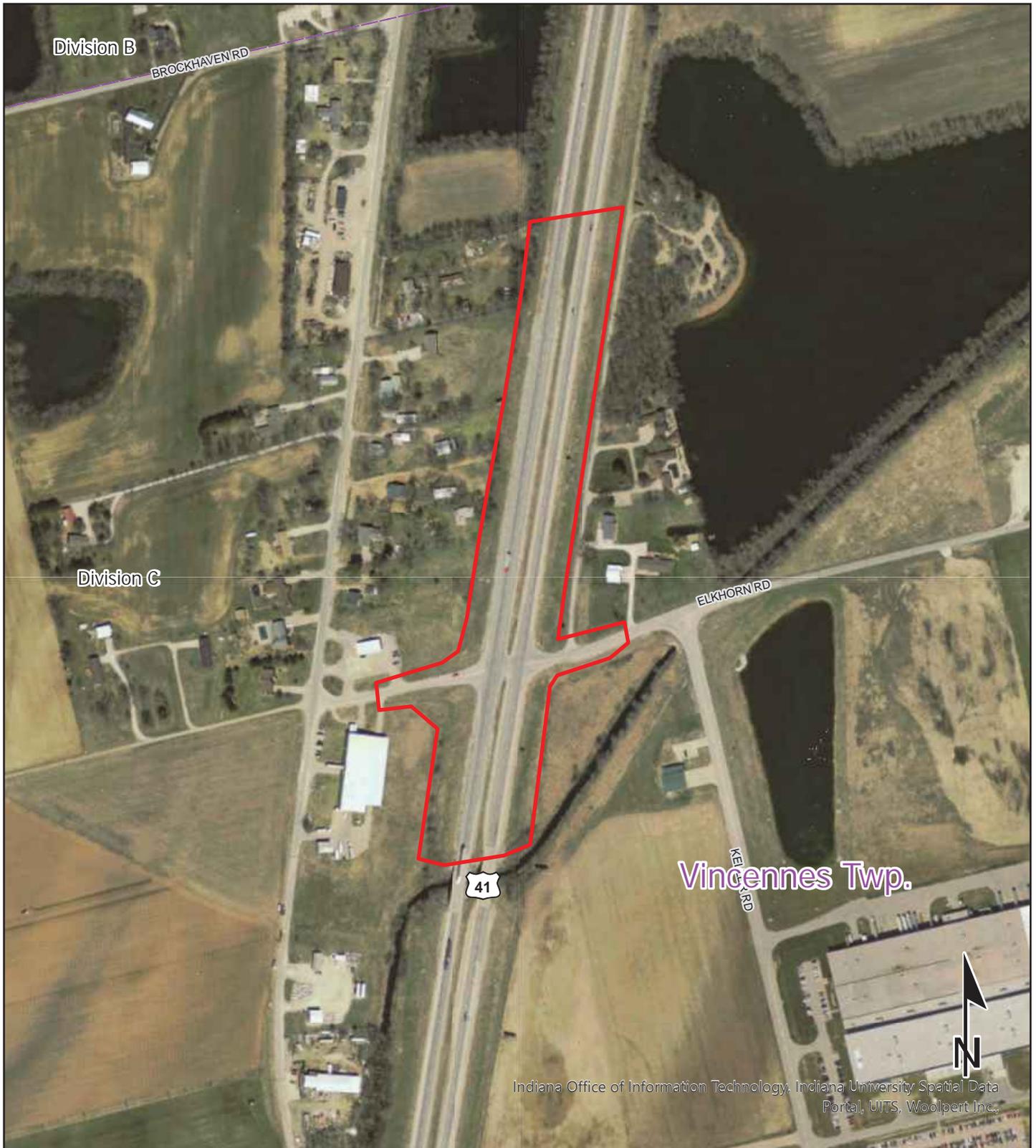
INDOT Vincennes District has determined that a CE-1 is appropriate for this project due to anticipated public involvement.

## APPENDIX B: GRAPHICS



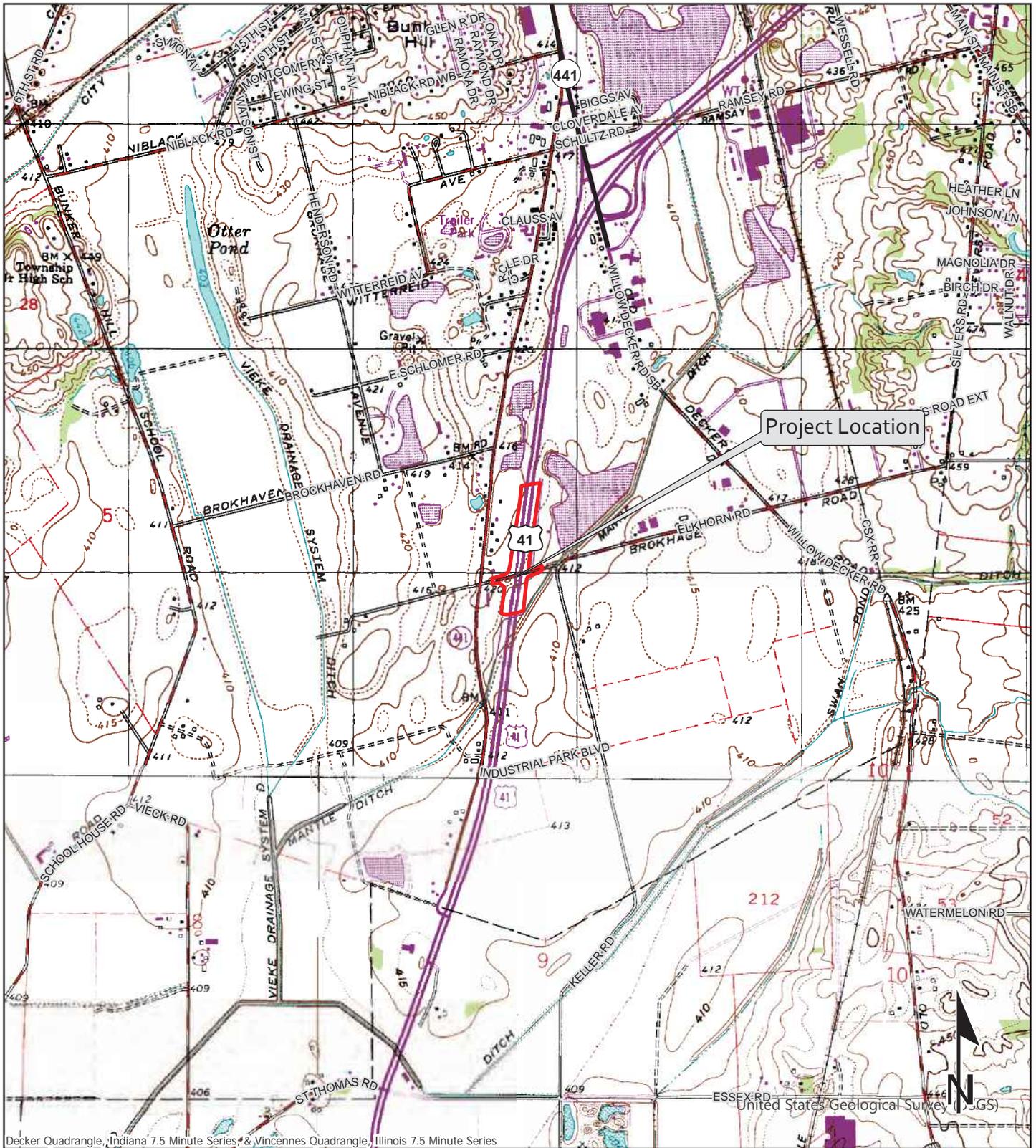
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community, Indiana Office of Information Technology, Indiana University Spatial Data Portal, UITS, Woolpert Inc., Indiana Office of Information Technology, Indiana University Spatial Data Portal, UITS, Woolpert Inc.,

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                        |                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li><span style="border: 2px solid red; display: inline-block; width: 20px; height: 10px; margin-right: 5px;"></span> Project Area</li> <li><span style="border: 2px solid purple; display: inline-block; width: 20px; height: 10px; margin-right: 5px;"></span> Knox County</li> <li><span style="border: 1px solid gray; display: inline-block; width: 20px; height: 10px; margin-right: 5px;"></span> County Boundaries</li> </ul> | <p><b>Project Location Map</b><br/>         US 41 and Elkhorn Road<br/>         Intersection Improvement Project<br/>         Knox County, Indiana</p> |                                                                                                                                          |
| <p>0      4.5      9<br/> <span style="display: inline-block; width: 100px; height: 10px; background: linear-gradient(to right, black 49%, white 49%, white 51%, black 51%);"></span> Miles</p>                                                                                                                                                                                                                                                                          | <p>Des. No. 1800224</p>                                                                                                                                |  <p>Graphics created by HNTB Corporation (2020)</p> |
| <p>1 inch = 9 miles</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                        |                                                                                                                                          |



Indiana Office of Information Technology, Indiana University Spatial Data Portal, UITS, Woolpert Inc.

|                                                                                                                 |                                                                                                                 |                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
|  Project Area                | <b>Project Aerial Map</b><br>US 41 and Elkhorn Road<br>Intersection Improvement Project<br>Knox County, Indiana |                                                                                                                                      |
| 0      200      400<br> Feet | Des. No. 1800224                                                                                                | <br>Graphics created by HNTB Corporation (2020) |
| 1 inch = 400 ft                                                                                                 |                                                                                                                 |                                                                                                                                      |



 Project Area

**USGS (1:24,000 scale) Topographic Map**

US 41 and Elkhorn Road  
Intersection Improvement Project  
Knox County, Indiana

0 1,000 2,000  
Feet

Des. No. 1800224

1 inch = 2,000 ft



Graphics created by HNTB Corporation (2020)



# Indiana Floodplain Information Portal Report

Figure 7: Floodplain Map  
US 41 at Elkhorn Road  
Intersection Improvements  
Knox County, Indiana

### Point of Interest

**Approximate Address:**

3200 US Hwy 41  
VINCENNES, IN 47591b

**Effective Flood Zone:**

X

**Preliminary Flood Zone:**

N/A

**Best Available Flood Zone:**

**Approximate Flood Elevation:**

410.5ft NAVD88

**Source:**

Zone A Model Delineationb

**Nearest Stream:**

MANTLE DITCH

### Map Legend

-  Point of Interest
-  Nearest Point on Stream

### Best Available Flood Zone

-  FEMA Zone AE Floodway
-  DNR Detailed Floodway
-  DNR Approximate Floodway
-  FEMA Zone A
-  FEMA Zone AE
-  DNR Detailed Fringe
-  DNR Approximate Fringe
-  Additional Floodplain Area
-  FEMA Protected by Levee
-  FEMA Floodplain - Ponding (Depth)
-  FEMA Floodplain - Sheet Flow (Depth)

### Site Map with Best Available Flood Zone



Approximate scale 1:2,400

### Disclaimer

Generated on Monday May 4th 2020 at 11:07:12am



July 9, 2020

**Wetlands**

- |                                                                                     |                                |                                                                                     |                                   |                                                                                       |          |
|-------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland       |  | Lake     |
|  | Estuarine and Marine Wetland   |  | Freshwater Forested/Shrub Wetland |  | Other    |
|                                                                                     |                                |  | Freshwater Pond                   |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.





|                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                     |                                                                                                                                              |                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li> Delineated Stream</li> <li> NHD Flowlines</li> <li> Investigated Area</li> </ul> | <ul style="list-style-type: none"> <li> Photo Locations</li> <li> Roadside Ditches</li> </ul> | <p><b>Photo Location Map</b><br/>         US 41 at Elkhorn Road<br/>         Intersection Improvements<br/>         Knox County, Indiana</p> |                                                                                                                                      |
| <p>0      125      250<br/>  Feet</p>                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     | <p>Des. No. 1800224</p> <p>1 inch = 250 feet</p>                                                                                             | <br>Graphics created by HNTB Corporation (2020) |



1. View of Mantle Ditch and investigated area looking east



3. View of Mantle Ditch and investigated area looking west



2. View of Mantle Ditch and investigated area looking east



4. View of Mantle Ditch and investigated area looking northeast



5. View of Mantle Ditch and investigated area looking west



7. View of Mantle Ditch and investigated area looking north



6. View of Mantle Ditch and investigated area looking east



8. View of UNT 1 to Mantle Ditch and investigated area looking south



9. View of UNT 1 to Mantle Ditch and investigated area looking south



11. View of UNT 1 to Mantle Ditch and investigated area looking north



10. View of UNT 1 to Mantle Ditch and investigated area looking north  
Des. No. 1800224



12. View of UNT 1 to Mantle Ditch and investigated area looking north



13. View of UNT 1 to Mantle Ditch and investigated area looking south



15. View of UNT 2 to Mantle Ditch and investigated area looking south



14. View of UNT 2 to Mantle Ditch looking north



16. View of UNT 2 to Mantle Ditch and investigated area looking south



17. View of UNT 2 to Mantle Ditch and investigated area looking north



19. View of UNT 2 to Mantle Ditch and investigated area looking north



18. View of UNT 2 to Mantle Ditch and investigated area looking south  
Des. No. 1800224



20. View of RSD 1 and investigated area looking north



21. View of RSD 1 and investigated area looking south



23. View of RSD 1 and investigated area looking south



22. View of RSD 1 and investigated area looking north



24. View of RSD 2 and investigated area looking west



25. View of RSD 2 and investigated area looking south



27. View of RSD 2 and investigated area looking north



26. View of RSD 2 and investigated area looking south



28. View of RSD 3 and investigated area looking northwest



29. View of RSD 3 and investigated area looking south



31. View of RSD 3 and investigated area looking north



30. View of RSD 3 and investigated area looking south



32. View of RSD 3 and investigated area looking south



33. View of RSD 3 and investigated area looking north



35. View of investigated area looking east



34. View of RSD 3 and investigated area looking north



36. View of investigated area looking east



37. View of investigated area looking south



39. View of investigated area looking north



38. View of investigated area looking south



40. View of investigated area looking south



41. View of investigated area looking Southeast



43. View of investigated area looking south



42. View of investigated area looking south



44. View of investigated area looking north



45. View of investigated area looking south



47. View of investigated area looking south



46. View of investigated area looking north



48. View of investigated area looking north



49. View of investigated area looking south



51. View of investigated area looking south



50. View of investigated area looking north



52. View of investigated area looking north



53. View of investigated area looking north



55. View of investigated area looking north



54. View of investigated area looking south



56. View of investigated area looking south



57. View of investigated area looking north



59. View of investigated area looking north



58. View of investigated area looking south



60. View of investigated area looking south



61. View of investigated area looking south

|          |             |
|----------|-------------|
| PROJECT  | DESIGNATION |
| 1800224  | 1800224     |
| CONTRACT |             |
| R-41472  |             |

NO ADDITIONAL  
RIGHT OF WAY  
REQUIRED

# INDIANA DEPARTMENT OF TRANSPORTATION



## ROAD PLANS U.S. 41 AT ELKHORN RD. INTERSECTION IMPROVEMENT

ROUTE: U.S. 41 FROM: RP 51+05 TO: RP 51+35

PROJECT NO.

P.E. 1800224

CONST. 1800224

**PROJECT DESCRIPTION**

INTERSECTION IMPROVEMENTS AND ROADWAY MODIFICATIONS ON U.S. 41 AT ELKHORN RD. LOCATED APPROXIMATELY 1.00 MILES SOUTH OF THE U.S. 41/BUS 41 INTERCHANGE IN SECTION 17, T-2-N, R-10-W, VINCENNES TOWNSHIP, KNOX COUNTY, INDIANA.

| TRAFFIC DATA U.S. 41     |        |                                 |
|--------------------------|--------|---------------------------------|
| A.A.D.T.                 | (2023) | 11,600 V.P.D.                   |
| A.A.D.T.                 | (2043) | 13,200 V.P.D.                   |
| D.H.V.                   | (2043) | 8.00%                           |
| DIRECTIONAL DISTRIBUTION |        | 54.00%                          |
| TRUCKS                   |        | 23.00% OF AADT<br>11.00% OF DHV |

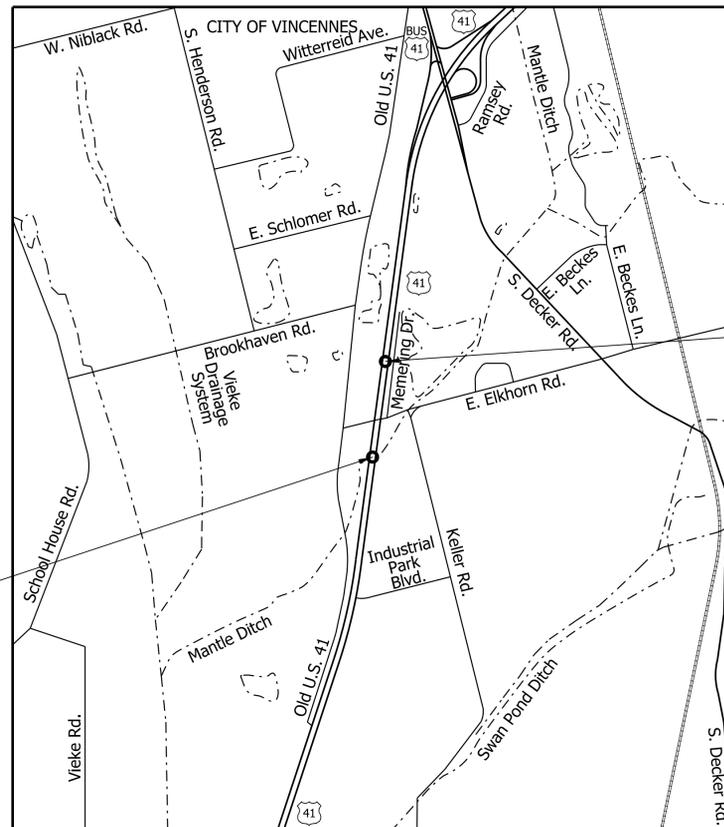
| DESIGN DATA U.S. 41       |                    |
|---------------------------|--------------------|
| DESIGN SPEED              | 60 MPH             |
| PROJECT DESIGN CRITERIA   | 3R NON-FREEWAY     |
| FUNCTIONAL CLASSIFICATION | PRINCIPAL ARTERIAL |
| RURAL/URBAN               | RURAL              |
| TERRAIN                   | LEVEL              |
| ACCESS CONTROL            | PARTIAL            |

| TRAFFIC DATA ELKHORN RD. |        |                                |
|--------------------------|--------|--------------------------------|
| A.A.D.T.                 | (2023) | 2,200 V.P.D.                   |
| A.A.D.T.                 | (2043) | 3,600 V.P.D.                   |
| D.H.V.                   | (2043) | 9.00%                          |
| DIRECTIONAL DISTRIBUTION |        | 66.00%                         |
| TRUCKS                   |        | 13.00% OF AADT<br>9.00% OF DHV |

| DESIGN DATA ELKHORN RD.   |                |
|---------------------------|----------------|
| DESIGN SPEED              | 40 MPH         |
| PROJECT DESIGN CRITERIA   | 3R NON-FREEWAY |
| FUNCTIONAL CLASSIFICATION | LOCAL ROAD     |
| RURAL/URBAN               | RURAL          |
| TERRAIN                   | LEVEL          |
| ACCESS CONTROL            | PARTIAL        |

STAGE 1 PLANS  
JUNE 26, 2020

BEGIN PROJECT  
PROJECT NO. 1800224  
P.O.T. STA. 454+37.00  
LINE "K"



END PROJECT  
PROJECT NO. 1800224  
P.O.T. STA. 471+10.00  
LINE "K"



PROJECT LOCATION SHOWN BY —

LATITUDE: 38°37'59"N      LONGITUDE: 87°31'53"W

GROSS LENGTH: 0.32 MI.  
NET LENGTH: 0.32 MI.  
MAX. GRADE: 0.50%

HYDROLOGIC UNIT CODE: 05120113020020

LOCATION MAP  
VINCENNES TOWNSHIP,  
KNOX COUNTY

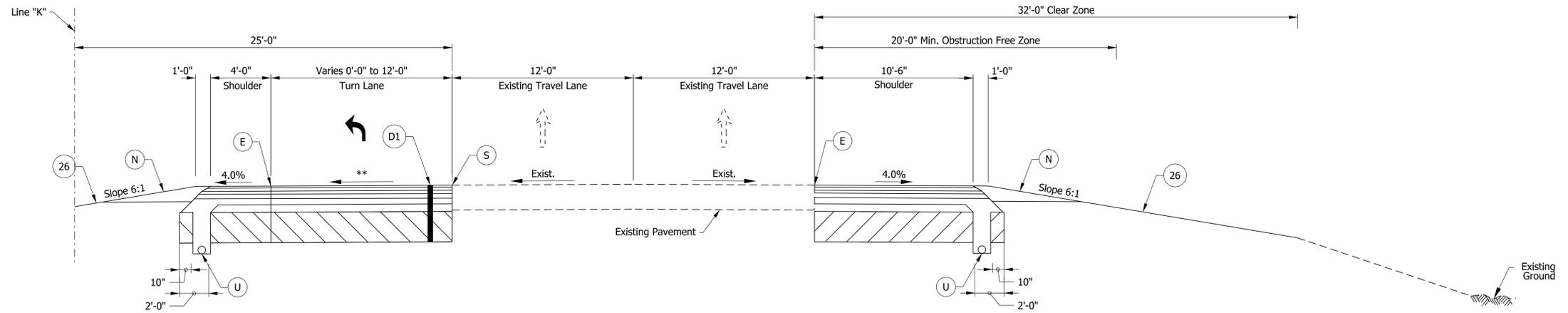
INDIANA DEPARTMENT OF TRANSPORTATION  
STANDARD SPECIFICATIONS DATED 2020  
TO BE USED WITH THESE PLANS

**HNTB**  
THE HNTB COMPANIES  
INFRASTRUCTURE SOLUTIONS  
111 MONUMENT CIRCLE  
SUITE 1200  
INDIANAPOLIS, IN 46204-5178

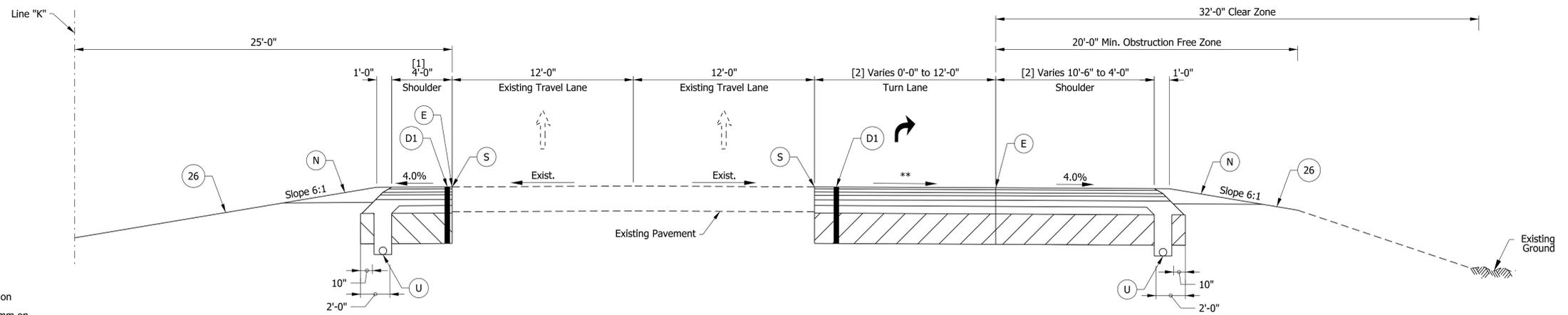
**DRAFT**  
NOT FOR CONSTRUCTION

PLANS PREPARED BY: HNTB INDIANA, INC. (317) 636-4682 PHONE NUMBER  
CERTIFIED BY: \_\_\_\_\_ DATE  
APPROVED FOR LETTING: \_\_\_\_\_ DATE  
INDIANA DEPARTMENT OF TRANSPORTATION

|             |         |
|-------------|---------|
| DESIGNATION |         |
| 1800224     |         |
| SURVEY BOOK | SHEETS  |
| ELECTRONIC  | 1 of 47 |
| CONTRACT    | PROJECT |
| R-41472     | 1800224 |



TYPICAL SECTION U.S. 41 NORTHBOUND  
STA. 460+85.00 "K" TO STA. 461+50.00 "K"



TYPICAL SECTION U.S. 41 NORTHBOUND  
STA. 454+37.00 "K" TO STA. 460+85.00 "K"

Legend

- D1 165#/Syd. QC/OA-HMA, 4, 70, Surface, 9.5 mm on 275#/Syd. QC/OA-HMA, 4, 70, Intermediate, 19.0 mm on 880#/Syd. QC/OA-HMA, 4, 64, Base, 25.0 mm on 300#/Syd. QC/OA-HMA, 4, 76, Intermediate OG, 19.0 mm on 6 in. of Compacted Aggregate No. 53 on Subgrade Treatment Type IC
- E Milled HMA Corrugations, Conventional (See Note 1)
- N Compacted Aggregate, No. 53
- S Saw Cut (No Direct Pay)
- U 6 In. Underdrain (See Std. Dwg. No. 718-UNDR-01)
- 26 Seed Mixture, R
- \*\* Proposed Cross Slope to Match Existing Slope of Adjacent Lane.
- \*\*\* Cross Slope Varies. See Spot Elevation Details for Additional Information.

[1] Omit Shoulder at Turn Lane  
STA. 459+41.38 "K" TO STA. 459+85.31 "K"

[1] Omit Turn Lane And Shoulder at Elkhorn Intersection  
STA. 458+98.61 "K" TO STA. 460+85.00 "K"

Note to Reviewer: Spot elevation details to be provided in a future submittal.

Note to Reviewer: Safety edge detail to be provided in a future submittal.

Notes

1. Milled HMA Corrugations, Conventional shall be installed per Std. Dwg. E 606-SHCG-02.
- Note to Reviewer: Pavement assumed to be asphalt. Final pavement design to be determined in a future submittal.

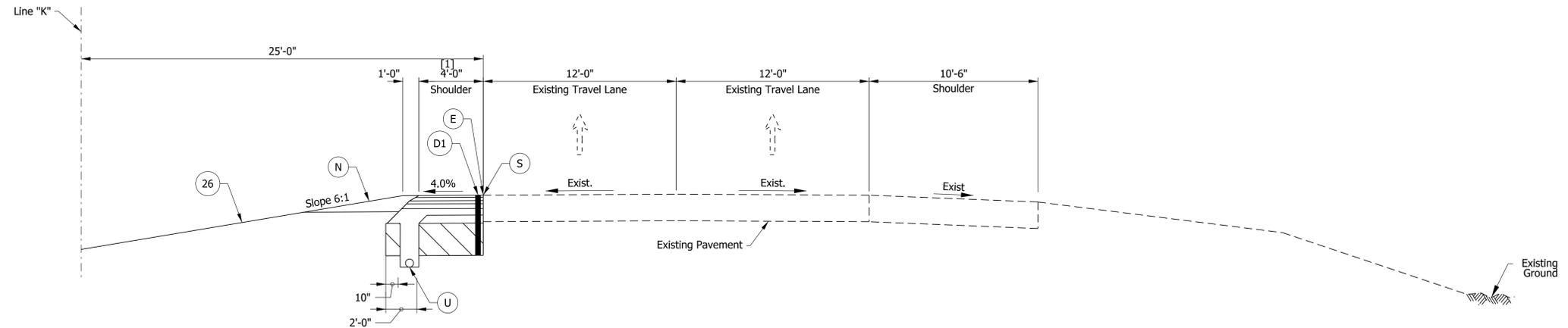
**DRAFT**  
NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

**INDIANA**  
**DEPARTMENT OF TRANSPORTATION**

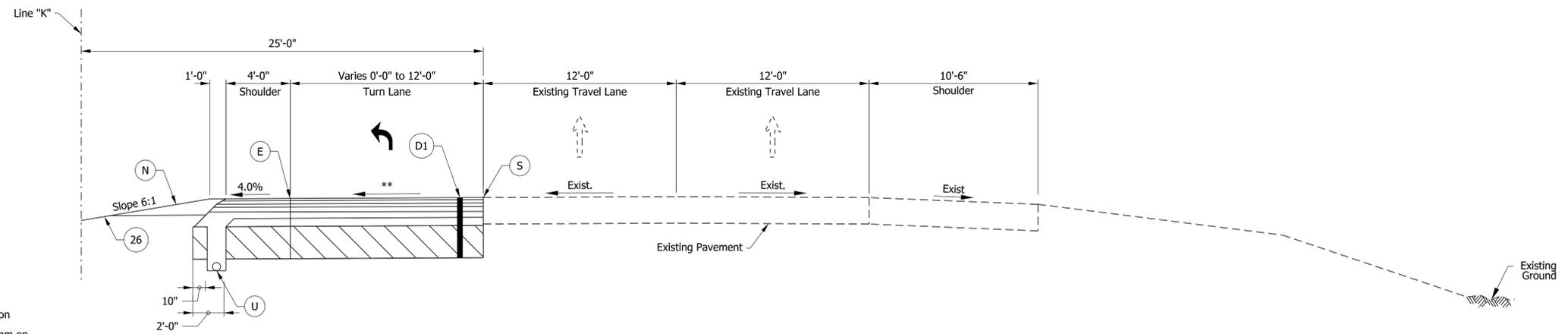
**ROADWAY TYPICAL CROSS SECTIONS**

|                  |             |       |
|------------------|-------------|-------|
| HORIZONTAL SCALE | BRIDGE FILE |       |
| 1/4"=1'-0"       | N/A         |       |
| VERTICAL SCALE   | DESIGNATION |       |
| N/A              | 1800224     |       |
| SURVEY BOOK      | SHEETS      | TS-01 |
| ELECTRONIC       | 3           | of 47 |
| CONTRACT         | PROJECT     |       |
| R-41472          | 1800224     |       |



[1] Omit Shoulder at Turn Lane  
STA. 469+25.70 "K" TO STA. 469+51.00 "K"

TYPICAL SECTION U.S. 41 NORTHBOUND  
STA. 469+25.70 "K" TO STA. 470+00.00 "K"



TYPICAL SECTION U.S. 41 NORTHBOUND  
STA. 461+50.00 "K" TO STA. 469+25.70 "K"

**Legend**

- D1 165#/Syd. QC/OA-HMA, 4, 70, Surface, 9.5 mm on 275#/Syd. QC/OA-HMA, 4, 70, Intermediate, 19.0 mm on 880#/Syd. QC/OA-HMA, 4, 64, Base, 25.0 mm on 300#/Syd. QC/OA-HMA, 4, 76, Intermediate OG, 19.0 mm on 6 in. of Compacted Aggregate No. 53 on Subgrade Treatment Type IC
  - E Milled HMA Corrugations, Conventional (See Note 1)
  - N Compacted Aggregate, No. 53
  - S Saw Cut (No Direct Pay)
  - U 6 In. Underdrain (See Std. Dwg. No. 718-UNDR-01)
  - 26 Seed Mixture, R
- \*\* Proposed Cross Slope to Match Existing Slope of Adjacent Lane.
- \*\*\* Cross Slope Varies. See Spot Elevation Details for Additional Information.

Note to Reviewer: Spot elevation details to be provided in a future submittal.

**Notes**

1. Milled HMA Corrugations, Conventional shall be installed per Std. Dwg. E 606-SHCG-02.

Note to Reviewer: Safety edge detail to be provided in a future submittal.

Note to Reviewer: Pavement assumed to be asphalt. Final pavement design to be determined in a future submittal.

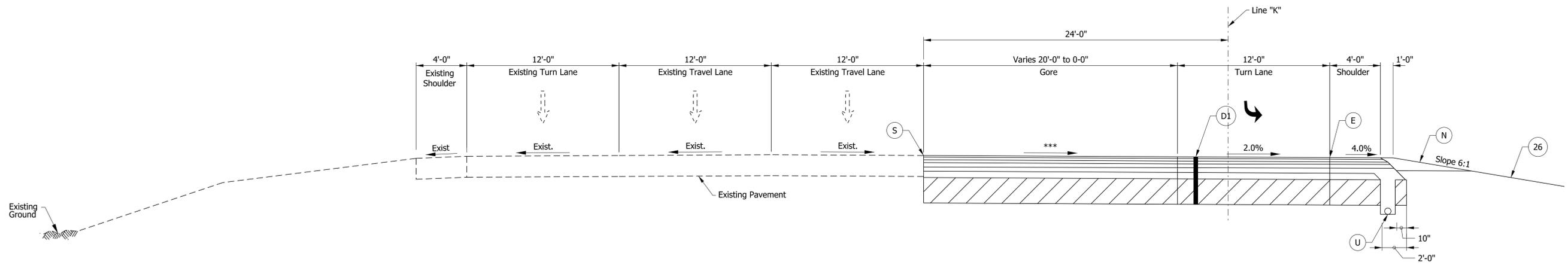
**DRAFT**  
NOT FOR CONSTRUCTION

|                                |                          |            |
|--------------------------------|--------------------------|------------|
| RECOMMENDED FOR APPROVAL _____ | DESIGN ENGINEER _____    | DATE _____ |
| DESIGNED: _____ NSX _____      | DRAWN: _____ LMC _____   |            |
| CHECKED: _____ TNE _____       | CHECKED: _____ NSX _____ |            |

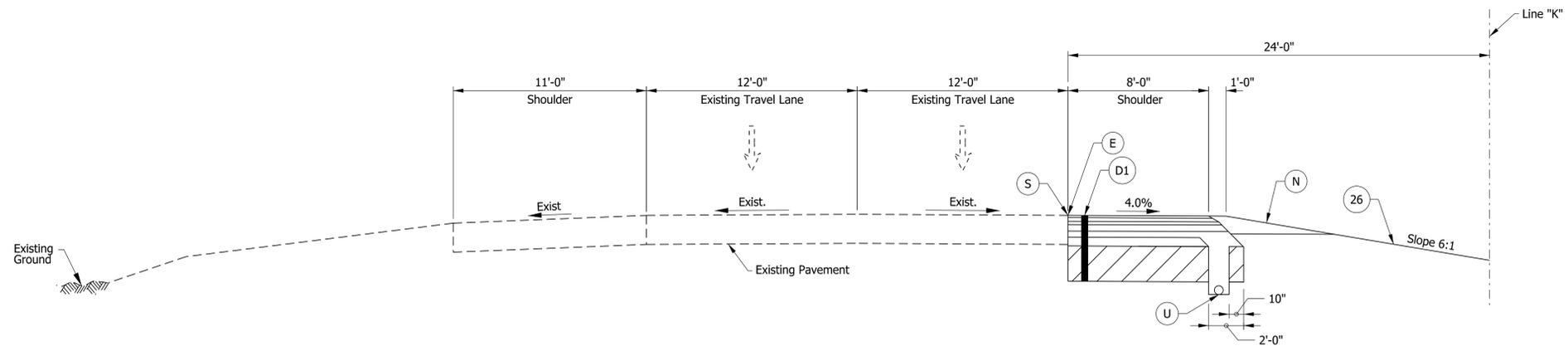
INDIANA  
DEPARTMENT OF TRANSPORTATION

ROADWAY TYPICAL CROSS SECTIONS

|                  |              |
|------------------|--------------|
| HORIZONTAL SCALE | BRIDGE FILE  |
| 1/4"=1'-0"       | N/A          |
| VERTICAL SCALE   | DESIGNATION  |
| N/A              | 1800224      |
| SURVEY BOOK      | SHEETS TS-02 |
| ELECTRONIC       | 4 of 47      |
| CONTRACT         | PROJECT      |
| R-41472          | 1800224      |



TYPICAL SECTION U.S. 41 SOUTHBOUND  
STA. 459+69.07 "K" TO STA. 462+10.00 "K"



TYPICAL SECTION U.S. 41 SOUTHBOUND  
STA. 457+50.00 "K" TO STA 459+69.07 "K"

- Legend**
- (D1) 165#/Syd. OC/QA-HMA, 4, 70, Surface, 9.5 mm on 275#/Syd. OC/QA-HMA, 4, 70, Intermediate, 19.0 mm on 880#/Syd. OC/QA-HMA, 4, 64, Base, 25.0 mm on 300#/Syd. OC/QA-HMA, 4, 76, Intermediate OG, 19.0 mm on 6 in. of Compacted Aggregate No. 53 on Subgrade Treatment Type IC
  - (E) Milled HMA Corrugations, Conventional (See Note 1)
  - (N) Compacted Aggregate, No. 53
  - (S) Saw Cut (No Direct Pay)
  - (U) 6 In. Underdrain (See Std. Dwg. No. 718-UNDR-01)
  - (26) Seed Mixture, R
- \*\* Proposed Cross Slope to Match Existing Slope of Adjacent Lane.  
\*\*\* Cross Slope Varies. See Spot Elevation Details for Additional Information.

Note to Reviewer; Spot elevation details to be provided in a future submittal.

Note to Reviewer; Safety edge detail to be provided in a future submittal.

**Notes**

1. Milled HMA Corrugations, Conventional shall be installed per Std. Dwg. E 606-SHCG-02.

Note to Reviewer: Pavement assumed to be asphalt. Final pavement design to be determined in a future submittal.

**DRAFT**  
NOT FOR CONSTRUCTION

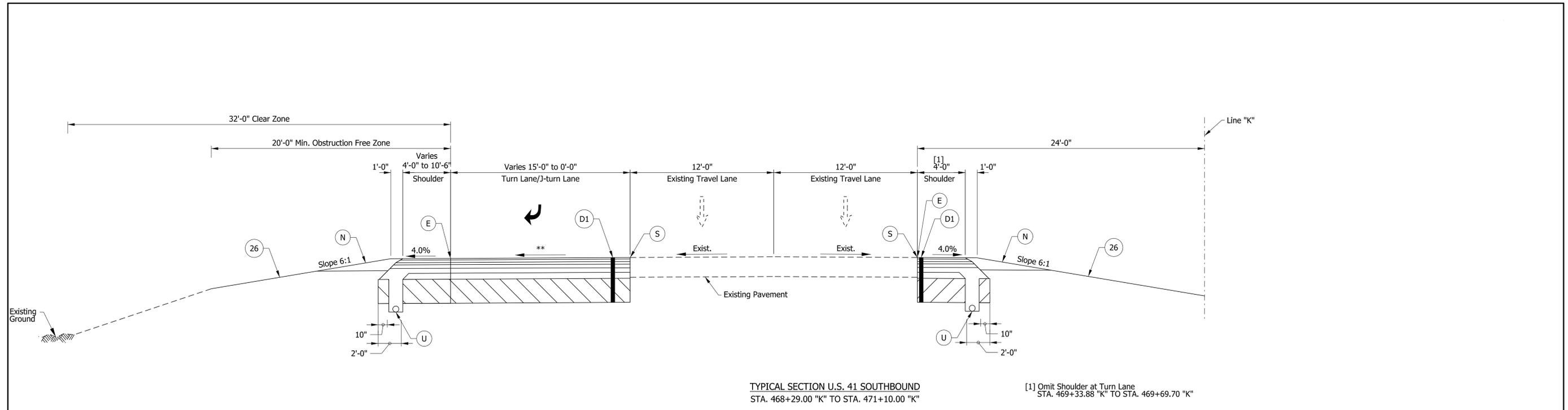
|                                |                          |            |
|--------------------------------|--------------------------|------------|
| RECOMMENDED FOR APPROVAL _____ | DESIGN ENGINEER _____    | DATE _____ |
| DESIGNED: _____ NSX _____      | DRAWN: _____ LMC _____   |            |
| CHECKED: _____ TNE _____       | CHECKED: _____ NSX _____ |            |

INDIANA  
DEPARTMENT OF TRANSPORTATION

ROADWAY TYPICAL CROSS SECTIONS

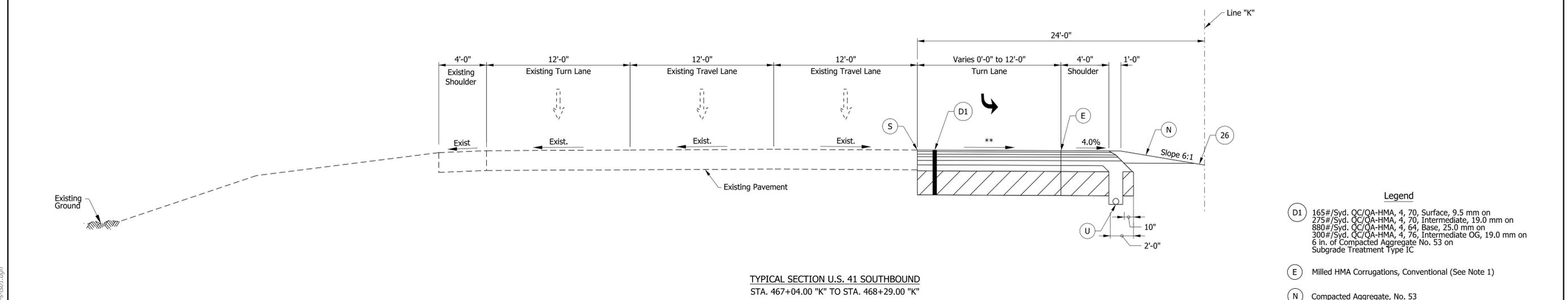
|                  |              |
|------------------|--------------|
| HORIZONTAL SCALE | BRIDGE FILE  |
| 1/4"=1'-0"       | N/A          |
| VERTICAL SCALE   | DESIGNATION  |
| N/A              | 1800224      |
| SURVEY BOOK      | SHEETS TS-03 |
| ELECTRONIC       | 5 of 47      |
| CONTRACT         | PROJECT      |
| R-41472          | 1800224      |

nsx01ng  
 6/28/2020 7:26:08 am  
 model:Sheet3  
 file: \\india\01\289\projects\1927-us 41 intersections\cadd\h\l\cals\1927-rd-s-ts01.dgn



TYPICAL SECTION U.S. 41 SOUTHBOUND  
STA. 468+29.00 "K" TO STA. 471+10.00 "K"

[1] Omit Shoulder at Turn Lane  
STA. 469+33.88 "K" TO STA. 469+69.70 "K"



TYPICAL SECTION U.S. 41 SOUTHBOUND  
STA. 467+04.00 "K" TO STA. 468+29.00 "K"

- Legend**
- D1 165#/Syd. OC/QA-HMA, 4, 70, Surface, 9.5 mm on 880#/Syd. OC/QA-HMA, 4, 70, Intermediate, 19.0 mm on 300#/Syd. OC/QA-HMA, 4, 64, Base, 25.0 mm on 6 in. of Compacted Aggregate No. 53 on Subgrade Treatment Type IC
  - E Milled HMA Corrugations, Conventional (See Note 1)
  - N Compacted Aggregate, No. 53
  - S Saw Cut (No Direct Pay)
  - U 6 In. Underdrain (See Std. Dwg. No. 718-UNDR-01)
  - 26 Seed Mixture, R
- \*\* Proposed Cross Slope to Match Existing Slope of Adjacent Lane.  
\*\*\* Cross Slope Varies. See Spot Elevation Details for Additional Information.

Note to Reviewer; Spot elevation details to be provided in a future submittal.

Note to Reviewer; Safety edge detail to be provided in a future submittal.

**Notes**

1. Milled HMA Corrugations, Conventional shall be installed per Std. Dwg. E 606-SHCG-02.

Note to Reviewer: Pavement assumed to be asphalt. Final pavement design to be determined in a future submittal.

**DRAFT**  
NOT FOR CONSTRUCTION

|                                |                          |            |
|--------------------------------|--------------------------|------------|
| RECOMMENDED FOR APPROVAL _____ | DESIGN ENGINEER _____    | DATE _____ |
| DESIGNED: _____ NSX _____      | DRAWN: _____ LMC _____   |            |
| CHECKED: _____ TNE _____       | CHECKED: _____ NSX _____ |            |

INDIANA  
DEPARTMENT OF TRANSPORTATION

ROADWAY TYPICAL CROSS SECTIONS

|                  |              |
|------------------|--------------|
| HORIZONTAL SCALE | BRIDGE FILE  |
| 1/4"=1'-0"       | N/A          |
| VERTICAL SCALE   | DESIGNATION  |
| N/A              | 1800224      |
| SURVEY BOOK      | SHEETS TS-04 |
| ELECTRONIC       | 6 of 47      |
| CONTRACT         | PROJECT      |
| R-41472          | 1800224      |

nxsong  
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 model:Sheet4  
 file: \\india\0289\projects\1927-us 41 intersections\cadd\h\cadd\1927-rd-s-ts01.dgn

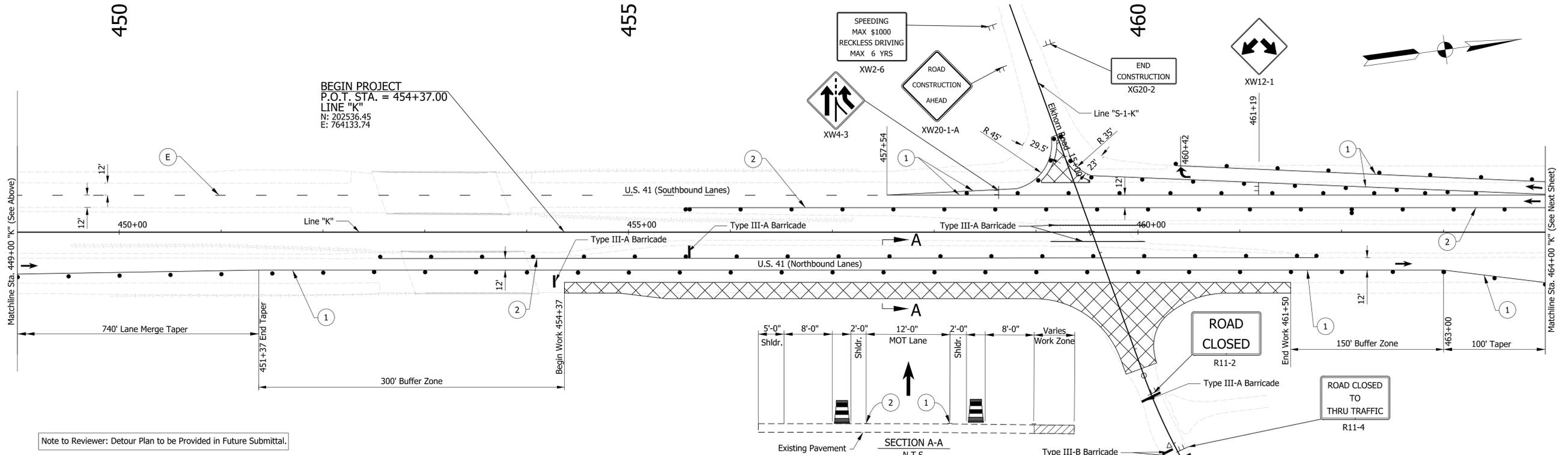
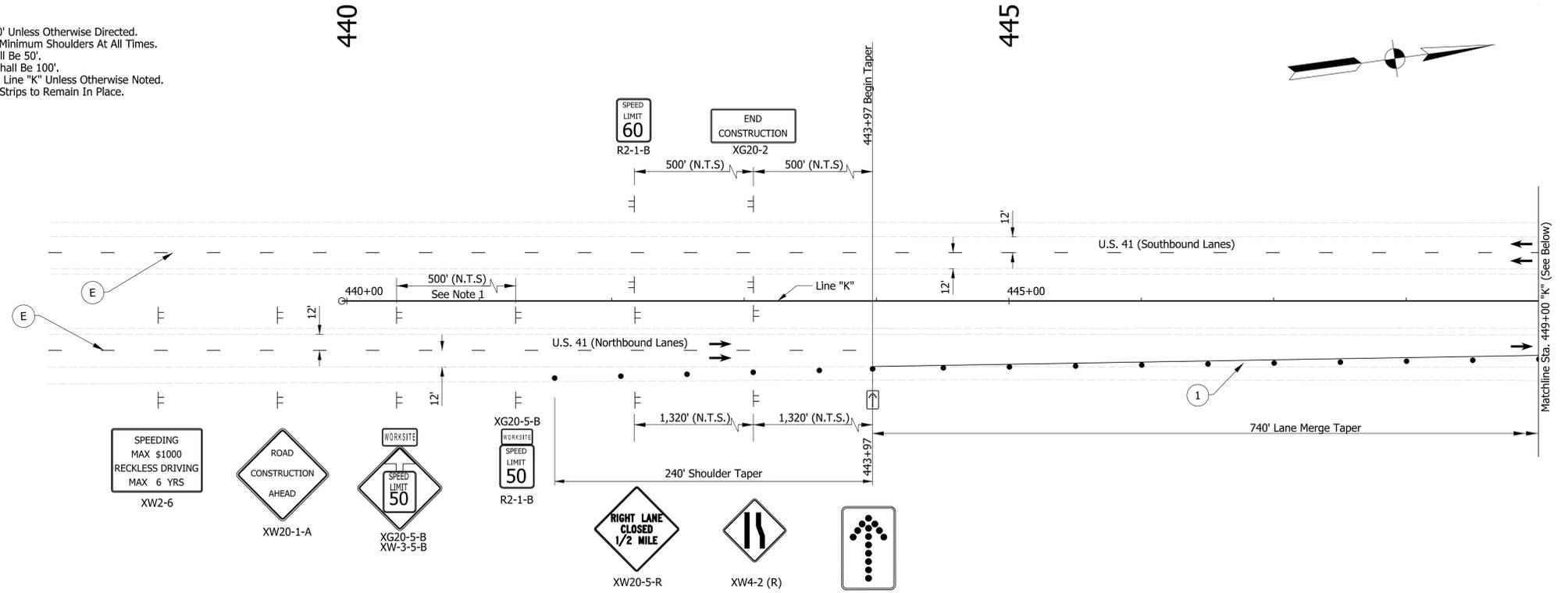
Construction Design Speed: 50 MPH  
 Construction Clear Zone: 16'-0"

- Notes:
1. All Sign Spacing Shall be 500' Unless Otherwise Directed.
  2. Contractor Shall Maintain 2' Minimum Shoulders At All Times.
  3. Drum Spacing in Tapers Shall Be 50'.
  4. Drum Spacing in Tangents Shall Be 100'.
  5. All Stations Referenced from Line "K" Unless Otherwise Noted.
  6. Existing Transverse Rumble Strips to Remain In Place.

**PHASE 1 CONSTRUCTION ACTIVITIES**

1. Install Advanced Warning Signs.
2. Remove Existing Pavement Markings and Install Temporary Pavement Markings In Lane Closure Locations As Shown.
3. Construct US 41 NB Right Turn Lane To Elkhorn Road.
4. Construct J-turn Loon and Median Island at US 41 and Elkhorn Road.

| Maintenance Of Traffic Summary - Phase 1 |                                                      |      |      |
|------------------------------------------|------------------------------------------------------|------|------|
| 1.                                       | Temporary Pavement Marking, Removable, 5 In (White)  | 5701 | LFT  |
| 2.                                       | Temporary Pavement Marking, Removable, 5 In (Yellow) | 2473 | LFT  |
| 3.                                       | Construction Sign, A                                 | 29   | EACH |
| 4.                                       | Barricade, III-A                                     | 240  | LFT  |
| 5.                                       | Temporary Worksite Speed Limit Sign Assembly         | 8    | EACH |
| 6.                                       | Flashing Arrow Sign                                  | 60   | DAY  |
| 7.                                       | Temporary Road Closure Sign Assembly                 | 2    | EACH |
| 8.                                       | Barricade, III-B                                     | 24   | LFT  |
| 9.                                       | Temporary Message Marking, Lane Indication Arrow     | 1    | EACH |



Note to Reviewer: Detour Plan to be Provided in Future Submittal.

|                                                                                                                                                                                            |                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Maintenance Of Traffic Legend</b>                                                                                                                                                       | <b>Temporary Pavement Marking Legend</b>                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>Construction Area</li> <li>Standard Drum</li> <li>Direction Of Traffic</li> <li>Barricade, III-A (12 Lft.)</li> <li>Construction Sign, A</li> </ul> | <ul style="list-style-type: none"> <li>1 Temporary Pavement Marking, Removable, 5 In. (White)</li> <li>2 Temporary Pavement Marking, Removable, 5 In. (Yellow)</li> <li>E Existing Pavement Marking</li> </ul> |

|                                      |                                |                       |            |
|--------------------------------------|--------------------------------|-----------------------|------------|
| <b>DRAFT</b><br>NOT FOR CONSTRUCTION | RECOMMENDED FOR APPROVAL _____ | DESIGN ENGINEER _____ | DATE _____ |
|                                      | DESIGNED: NSX                  | DRAWN: LMC            |            |
|                                      | CHECKED: TNE                   | CHECKED: NSX          |            |
|                                      |                                |                       |            |

INDIANA  
DEPARTMENT OF TRANSPORTATION

**MAINTENANCE OF TRAFFIC  
PHASE 1**

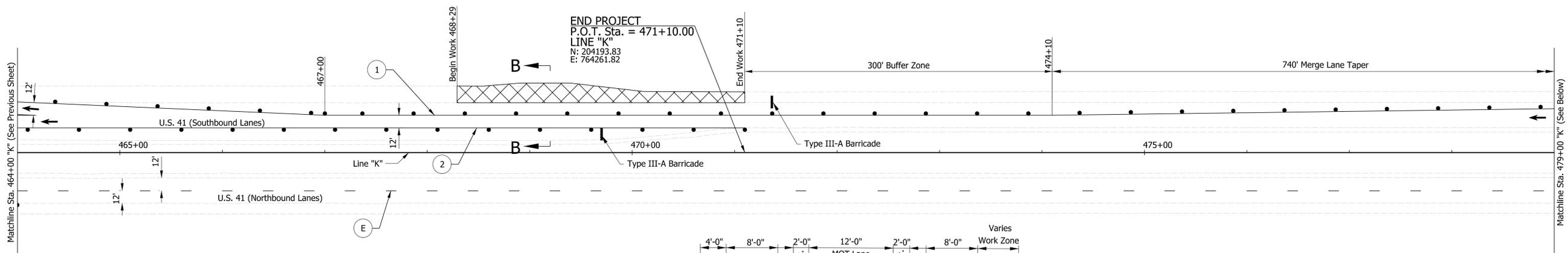
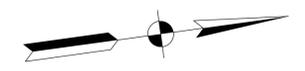
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|------------------|-------------|
| HORIZONTAL SCALE | BRIDGE FILE |
| 1"=50'           | N/A         |
| VERTICAL SCALE   | DESIGNATION |
| N/A              | 1800224     |
| SURVEY BOOK      | SHEETS      |
| ELECTRONIC       | 8 of 47     |
| CONTRACT         | PROJECT     |
| R-41472          | 1800224     |

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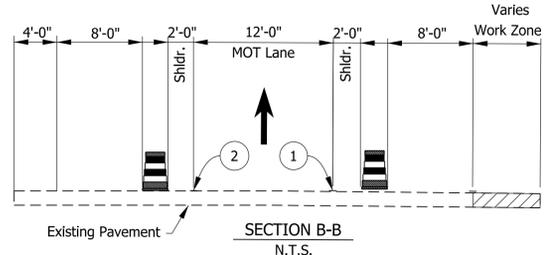
465

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475



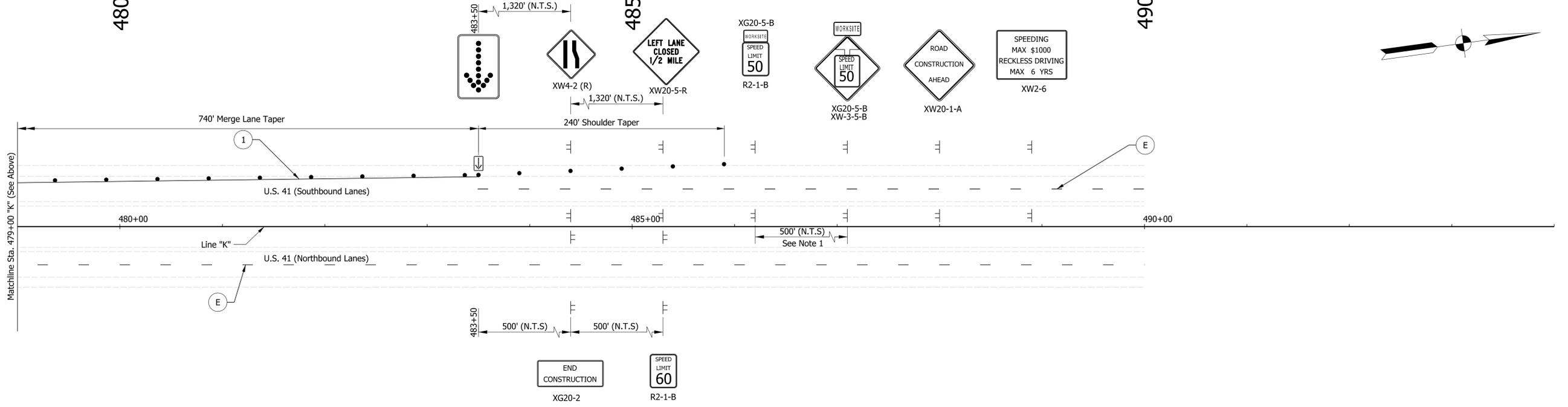
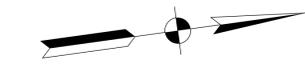
- Notes:
1. All Sign Spacing Shall be 500' Unless Otherwise Directed.
  2. Contractor Shall Maintain 2' Minimum Shoulders At All Times.
  3. Drum Spacing in Tapers Shall Be 50'.
  4. Drum Spacing in Tangents Shall Be 100'.
  5. All Stations Referenced from Line "K" Unless Otherwise Noted.
  6. Existing Transverse Rumble Strips to Remain In Place.



480

485

490



- Maintenance Of Traffic Legend
- Construction Area
  - Standard Drum
  - Direction Of Traffic
  - Barricade, III-A (12 Lft.)
  - Construction Sign, A

- Temporary Pavement Marking Legend
- 1 Temporary Pavement Marking, Removable, 5 In. (White)
  - 2 Temporary Pavement Marking, Removable, 5 In. (Yellow)
  - E Existing Pavement Marking

**DRAFT**  
NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

INDIANA  
DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC  
PHASE 1

|                  |             |
|------------------|-------------|
| HORIZONTAL SCALE | BRIDGE FILE |
| 1"=50'           | N/A         |
| VERTICAL SCALE   | DESIGNATION |
| N/A              | 1800224     |
| SURVEY BOOK      | SHEETS      |
| ELECTRONIC       | 9 of 47     |
| CONTRACT         | PROJECT     |
| R-41472          | 1800224     |

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 file: \\indiv001\289\projects\74927-us 41 intersections\cadd\h1\cadd\74927-rd-s-mot01.dgn

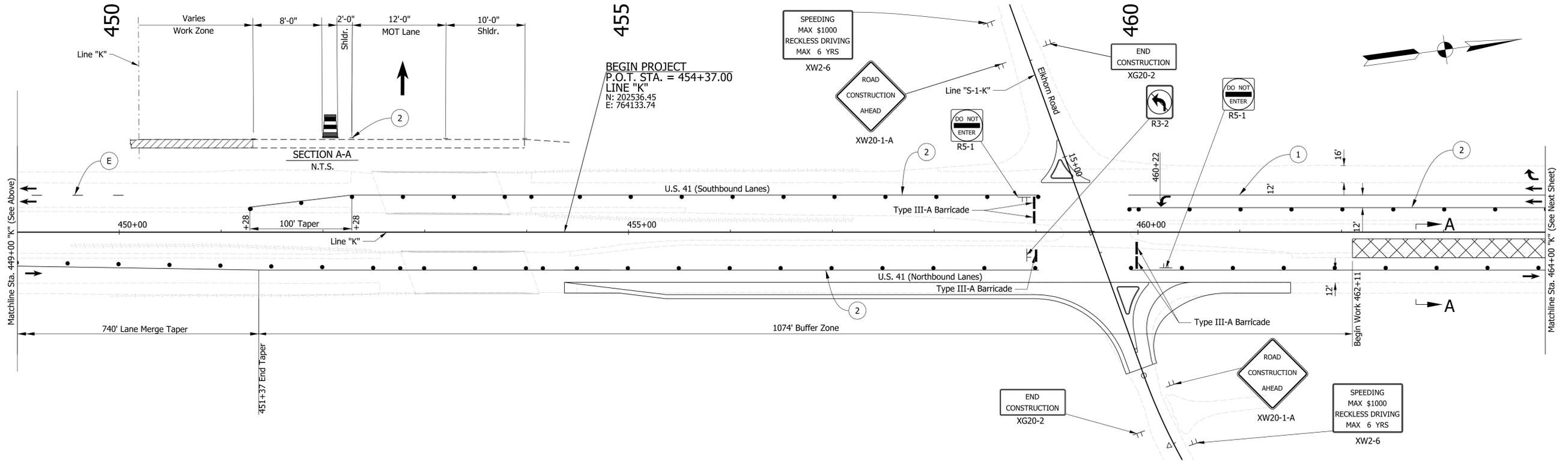
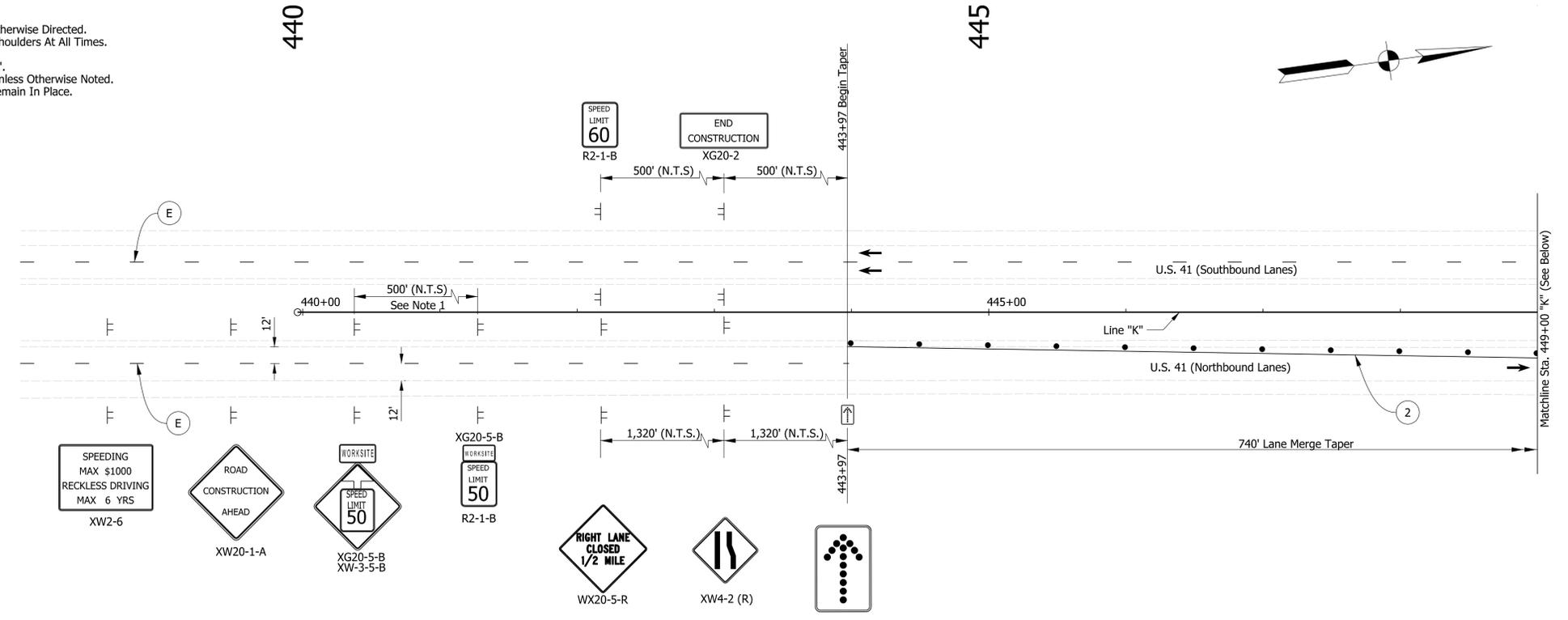
Construction Design Speed: 50 MPH  
 Construction Clear Zone: 16'-0"

- Notes:
1. All Sign Spacing Shall be 500' Unless Otherwise Directed.
  2. Contractor Shall Maintain 2' Minimum Shoulders At All Times.
  3. Drum Spacing in Tapers Shall Be 50'.
  4. Drum Spacing in Tangents Shall Be 100'.
  5. All Stations Referenced from Line "K" Unless Otherwise Noted.
  6. Existing Transverse Rumble Strips to Remain In Place.

**PHASE 2 CONSTRUCTION ACTIVITIES**

1. Construct Pavement In Median For New Reduced Conflict Intersection (RCI) Vehicle Movement. Close Adjacent Shoulders.
2. Install And Cover Proposed Signage At RCI Along U.S. 41 And Elkhorn Road Approaches.
3. Remove Existing Pavement Markings And Install Temporary Pavement Markings In Traffic Lane Closure Locations As Shown.

| Maintenance Of Traffic Summary - Phase 2 |                                                      |      |      |
|------------------------------------------|------------------------------------------------------|------|------|
| 1.                                       | Temporary Pavement Marking, Removable, 5 In (White)  | 510  | LFT  |
| 2.                                       | Temporary Pavement Marking, Removable, 5 In (Yellow) | 5480 | LFT  |
| 3.                                       | Construction Sign, A                                 | 6    | EACH |
| 4.                                       | Barricade, III-A                                     | 72   | LFT  |
| 5.                                       | Temporary Worksite Speed Limit Sign Assembly         | 0    | EACH |
| 6.                                       | Flashing Arrow Sign                                  | 60   | DAY  |
| 7.                                       | Temporary Message Marking, Lane Indication Arrow     | 1    | EACH |



**Maintenance Of Traffic Legend**

|  |                            |
|--|----------------------------|
|  | Construction Area          |
|  | Standard Drum              |
|  | Direction Of Traffic       |
|  | Barricade, III-A (12 Lft.) |
|  | Construction Sign, A       |

**Temporary Pavement Marking Legend**

|  |                                                       |
|--|-------------------------------------------------------|
|  | Temporary Pavement Marking, Removable, 5 in. (White)  |
|  | Temporary Pavement Marking, Removable, 5 in. (Yellow) |
|  | Existing Pavement Marking                             |

**DRAFT**  
NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

INDIANA  
DEPARTMENT OF TRANSPORTATION

**MAINTENANCE OF TRAFFIC  
PHASE 2**

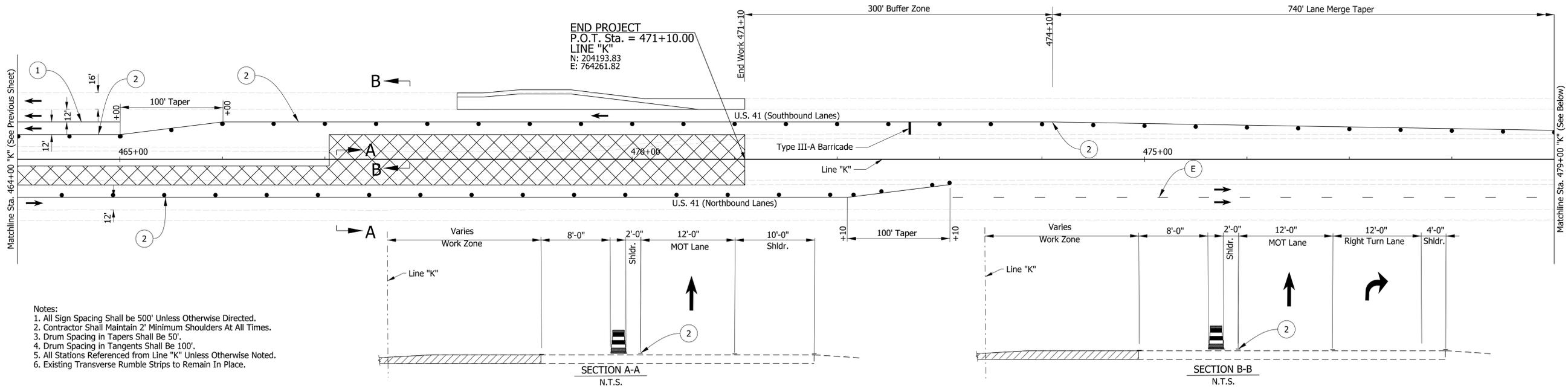
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|------------------|-------------|
| HORIZONTAL SCALE | BRIDGE FILE |
| 1"=50'           | N/A         |
| VERTICAL SCALE   | DESIGNATION |
| N/A              | 1800224     |
| SURVEY BOOK      | SHEETS      |
| ELECTRONIC       | 10 of 47    |
| CONTRACT         | PROJECT     |
| R-41472          | 1800224     |

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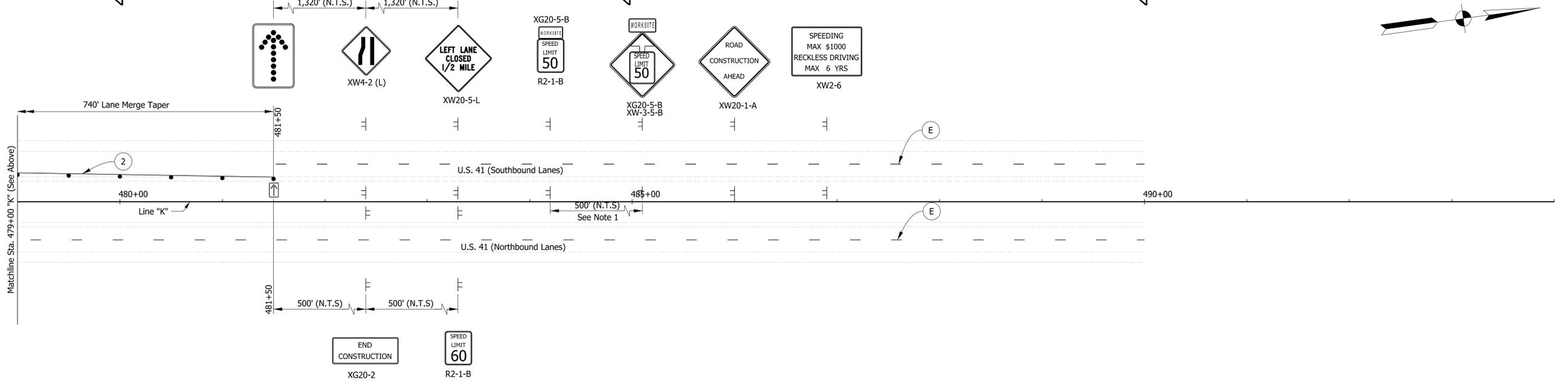
475



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**Maintenance Of Traffic Legend**

|  |                            |
|--|----------------------------|
|  | Construction Area          |
|  | Standard Drum              |
|  | Direction Of Traffic       |
|  | Barricade, III-A (12 Lft.) |
|  | Construction Sign, A       |

**Temporary Pavement Marking Legend**

|   |                                                       |
|---|-------------------------------------------------------|
| ① | Temporary Pavement Marking, Removable, 5 in. (White)  |
| ② | Temporary Pavement Marking, Removable, 5 in. (Yellow) |
| E | Existing Pavement Marking                             |

**DRAFT**  
NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

INDIANA  
DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC  
PHASE 2

|                  |             |
|------------------|-------------|
| HORIZONTAL SCALE | BRIDGE FILE |
| 1"=50'           | N/A         |
| VERTICAL SCALE   | DESIGNATION |
| N/A              | 1800224     |
| SURVEY BOOK      | SHEETS      |
| ELECTRONIC       | 11 of 47    |
| CONTRACT         | PROJECT     |
| R-41472          | 1800224     |

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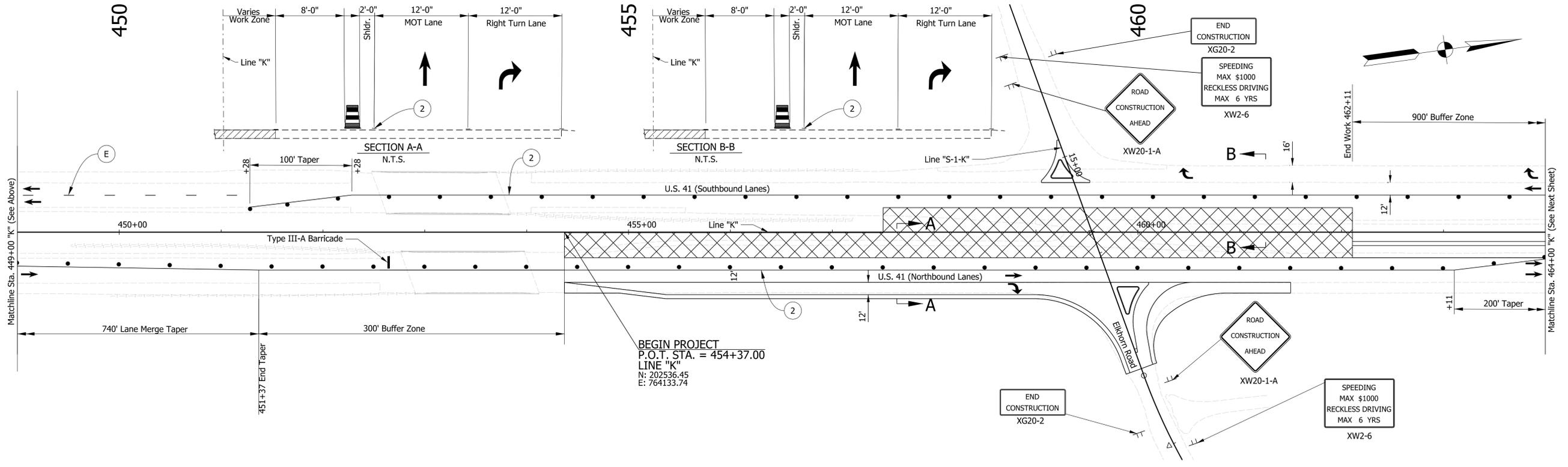
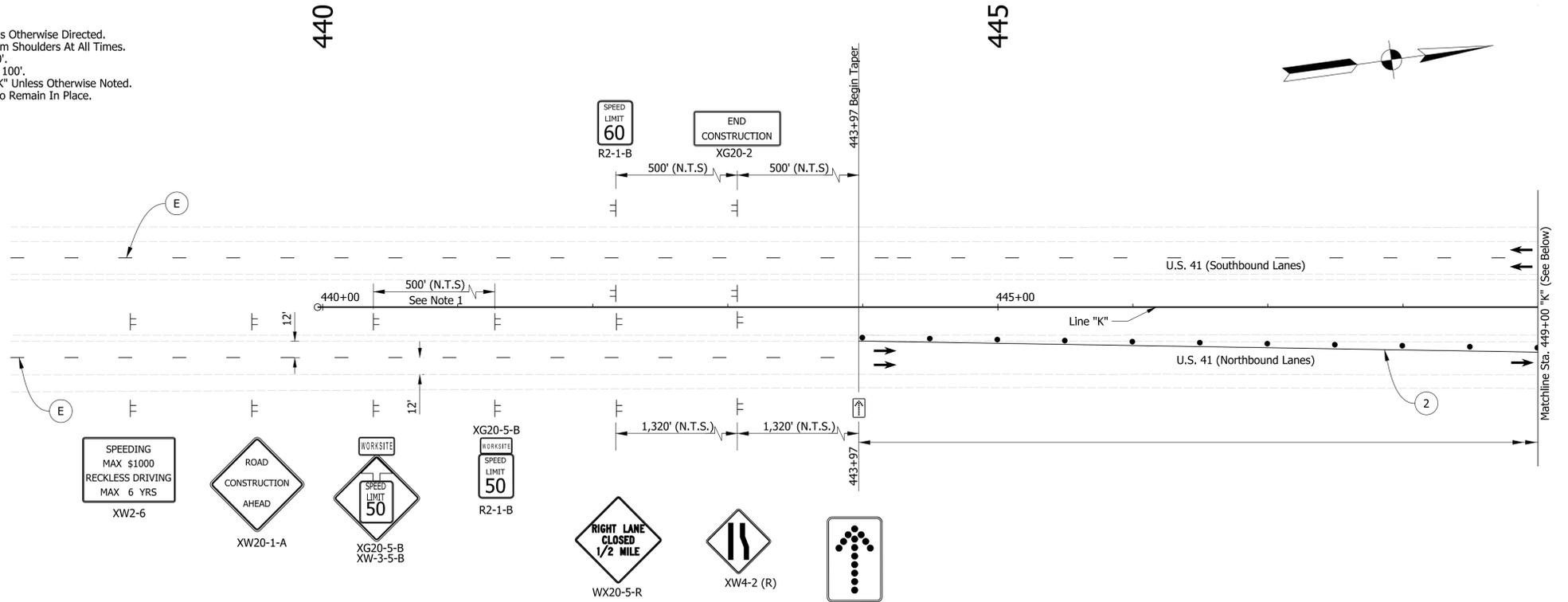
Construction Design Speed: 50 MPH  
 Construction Clear Zone: 16'-0"

- Notes:
1. All Sign Spacing Shall be 500' Unless Otherwise Directed.
  2. Contractor Shall Maintain 2' Minimum Shoulders At All Times.
  3. Drum Spacing in Tapers Shall Be 50'.
  4. Drum Spacing in Tangents Shall Be 100'.
  5. All Stations Referenced from Line "K" Unless Otherwise Noted.
  6. Existing Transverse Rumble Strips to Remain In Place.

**PHASE 3 CONSTRUCTION ACTIVITIES**

1. Uncover Proposed Signage On All Road Approaches.
2. Remove Existing Pavement Markings and Install Temporary Pavement Markings In Traffic Lane Closure Locations As Shown.
3. Construct Proposed USH 41 SB Left Turn Lane to Elkhorn Road.

| Maintenance Of Traffic Summary - Phase 3 |                                                      |      |      |
|------------------------------------------|------------------------------------------------------|------|------|
| 1.                                       | Temporary Pavement Marking, Removable, 5 In (Yellow) | 5480 | LFT  |
| 2.                                       | Construction Sign, A                                 | 0    | EACH |
| 3.                                       | Barricade, III-A                                     | 24   | LFT  |
| 4.                                       | Temporary Worksite Speed Limit Sign Assembly         | 0    | EACH |
| 5.                                       | Flashing Arrow Sign                                  | 60   | DAY  |



BEGIN PROJECT  
 P.O.T. STA. = 454+37.00  
 LINE "K"  
 N: 202536.45  
 E: 764133.74

- Maintenance Of Traffic Legend**
- Construction Area
  - Standard Drum
  - Direction Of Traffic
  - Barricade, III-A (12 Lft.)
  - Construction Sign, A
- Temporary Pavement Marking Legend**
- Temporary Pavement Marking, Removable, 5 in. (Yellow)
  - Existing Pavement Marking

**DRAFT**  
 NOT FOR CONSTRUCTION

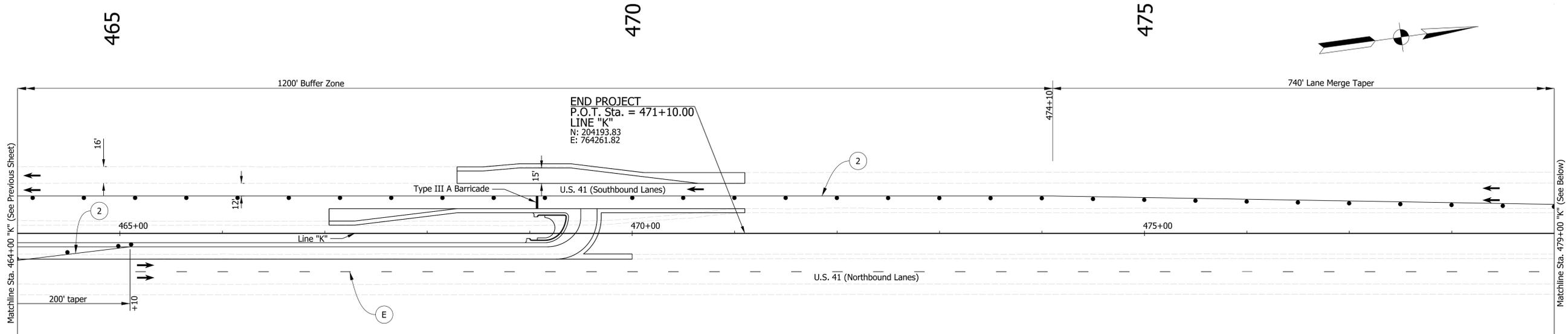
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|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

INDIANA  
 DEPARTMENT OF TRANSPORTATION

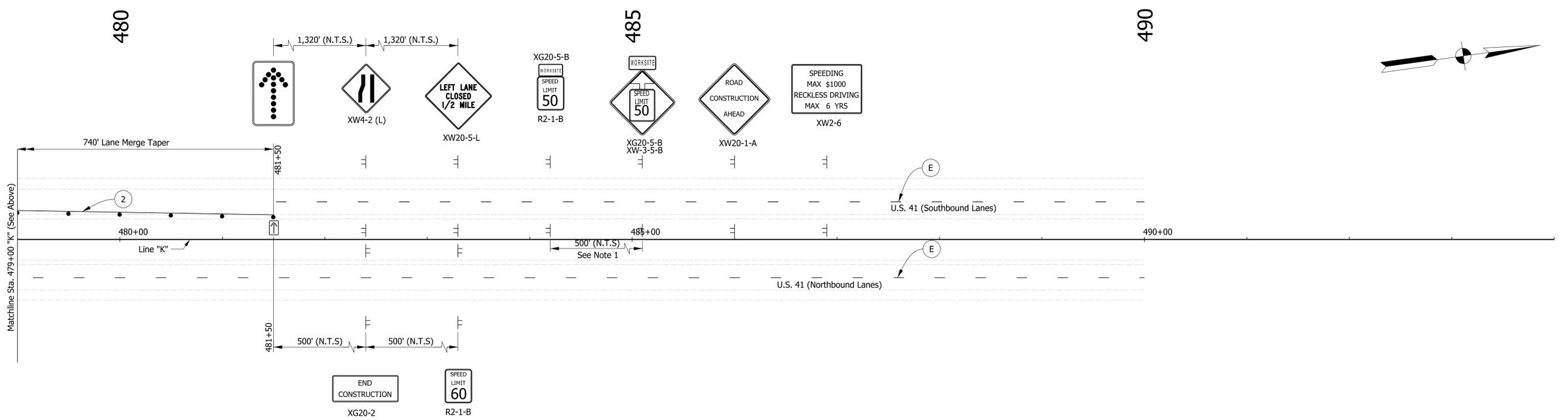
**MAINTENANCE OF TRAFFIC  
 PHASE 3**

|                  |             |
|------------------|-------------|
| HORIZONTAL SCALE | BRIDGE FILE |
| 1"=50'           | N/A         |
| VERTICAL SCALE   | DESIGNATION |
| N/A              | 1800224     |
| SURVEY BOOK      | SHEETS      |
| ELECTRONIC       | 12 of 47    |
| CONTRACT         | PROJECT     |
| R-41472          | 1800224     |

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 file: \\indiv001\289\projects\74927-us 41 intersections\cadd\h1\cbs\74927-rd-s-mot03.dgn



- Notes:
1. All Sign Spacing Shall be 500' Unless Otherwise Directed.
  2. Contractor Shall Maintain 2' Minimum Shoulders At All Times.
  3. Drum Spacing in Tapers Shall Be 50'.
  4. Drum Spacing in Tangents Shall Be 100'.
  5. All Stations Referenced from Line "K" Unless Otherwise Noted.
  6. Existing Transverse Rumble Strips to Remain In Place.



- Maintenance Of Traffic Legend
- Construction Area
  - Standard Drum
  - Direction Of Traffic
  - Barricade, III-A (12 Lft.)
  - Construction Sign, A
- Temporary Pavement Marking Legend
- 2 Temporary Pavement Marking, Removable, 5 in. (Yellow)
  - E Existing Pavement Marking

**DRAFT**  
NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

INDIANA  
DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC  
PHASE 3

|                  |             |
|------------------|-------------|
| HORIZONTAL SCALE | BRIDGE FILE |
| 1"=50'           | N/A         |
| VERTICAL SCALE   | DESIGNATION |
| N/A              | 1800224     |
| SURVEY BOOK      | SHEETS      |
| ELECTRONIC       | 13 of 47    |
| CONTRACT         | PROJECT     |
| R-41472          | 1800224     |

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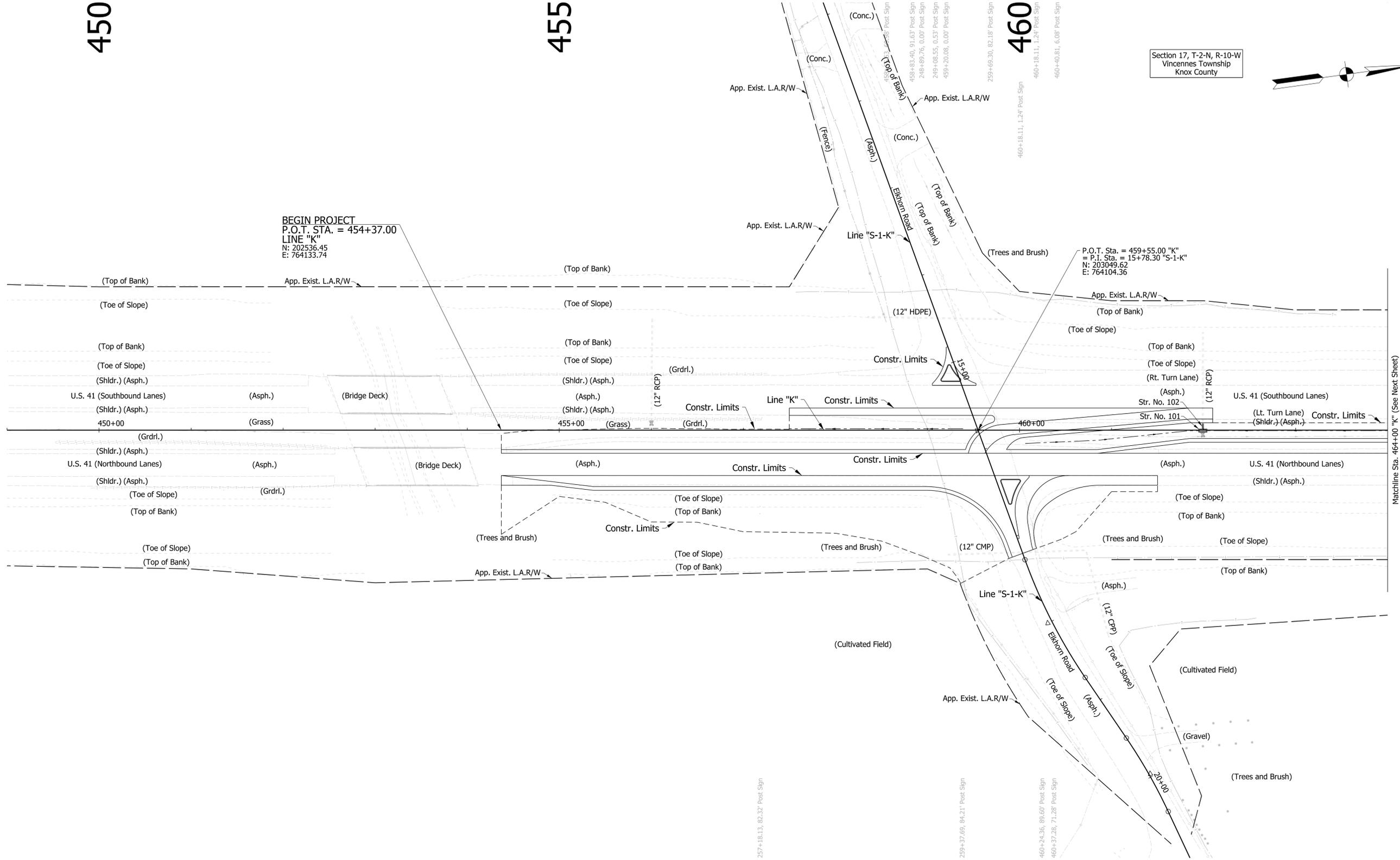
460

Section 17, T-2-N, R-10-W  
Vincennes Township  
Knox County



BEGIN PROJECT  
P.O.T. STA. = 454+37.00  
LINE "K"  
N: 202536.45  
E: 764133.74

P.O.T. Sta. = 459+55.00 "K"  
= P.I. Sta. = 15+78.30 "S-1-K"  
N: 203049.62  
E: 764104.36



Matchline Sta. 464+00 "K" (See Next Sheet)

**DRAFT**  
NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

INDIANA  
DEPARTMENT OF TRANSPORTATION

ROADWAY PLAN  
U.S. 41 - LINE "K"  
STA. 449+00 TO STA. 464+00

|                  |             |        |
|------------------|-------------|--------|
| HORIZONTAL SCALE | BRIDGE FILE |        |
| 1"=50'           | N/A         |        |
| VERTICAL SCALE   | DESIGNATION |        |
| N/A              | 1800224     |        |
| SURVEY BOOK      | SHEETS      | PLN-01 |
| ELECTRONIC       | 14          | of 47  |
| CONTRACT         | PROJECT     |        |
| R-41472          | 1800224     |        |

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file: \\indw001\289\projects\1927-us 41 intersections\cadd\1\cadd\1927-rd-s-ph01.dgn

465

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475

Section 17, T-2-N, R-10-W  
Vincennes Township  
Knox County

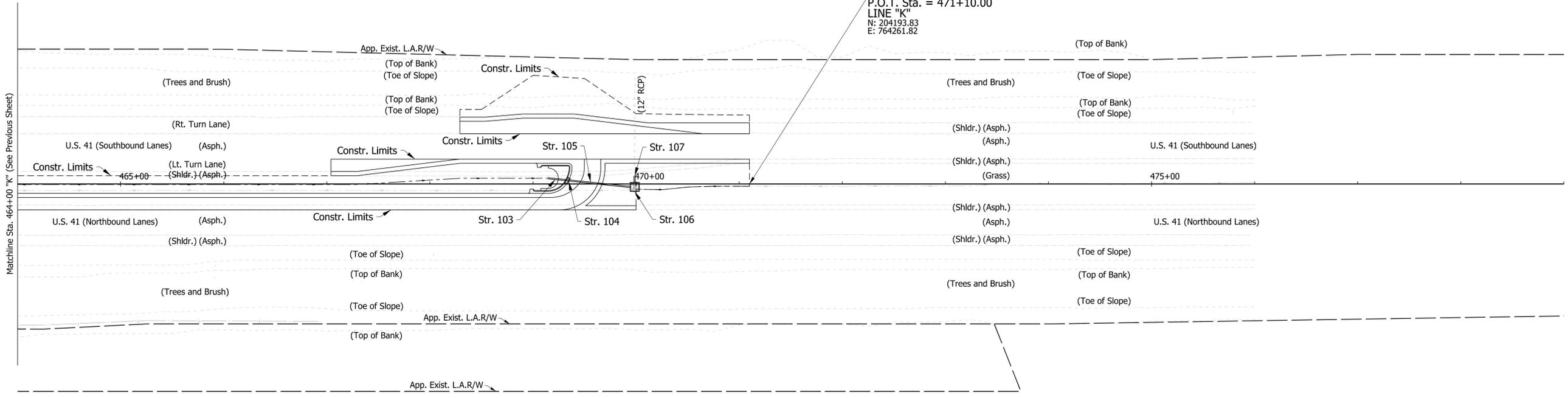


465+09.35, 72.47' Post Sign

465+91.76, 76.86' Post Sign

468+03.38, 66.78' Post Sign

END PROJECT  
P.O.T. Sta. = 471+10.00  
LINE "K"  
N: 204193.83  
E: 764261.82



Matchline Sta. 464+00 "K" (See Previous Sheet)

**DRAFT**  
NOT FOR CONSTRUCTION

|                                |                          |            |
|--------------------------------|--------------------------|------------|
| RECOMMENDED FOR APPROVAL _____ | DESIGN ENGINEER _____    | DATE _____ |
| DESIGNED: _____ NSX _____      | DRAWN: _____ LMC _____   |            |
| CHECKED: _____ TNE _____       | CHECKED: _____ NSX _____ |            |

INDIANA  
DEPARTMENT OF TRANSPORTATION

ROADWAY PLAN  
U.S. 41 - LINE "K"  
STA. 464+00 TO STA. 479+00

|                  |             |        |
|------------------|-------------|--------|
| HORIZONTAL SCALE | BRIDGE FILE |        |
| 1"=50'           | N/A         |        |
| VERTICAL SCALE   | DESIGNATION |        |
| N/A              | 1800224     |        |
| SURVEY BOOK      | SHEETS      | PLN-03 |
| ELECTRONIC       | 16          | of 47  |
| CONTRACT         | PROJECT     |        |
| R-41472          | 1800224     |        |

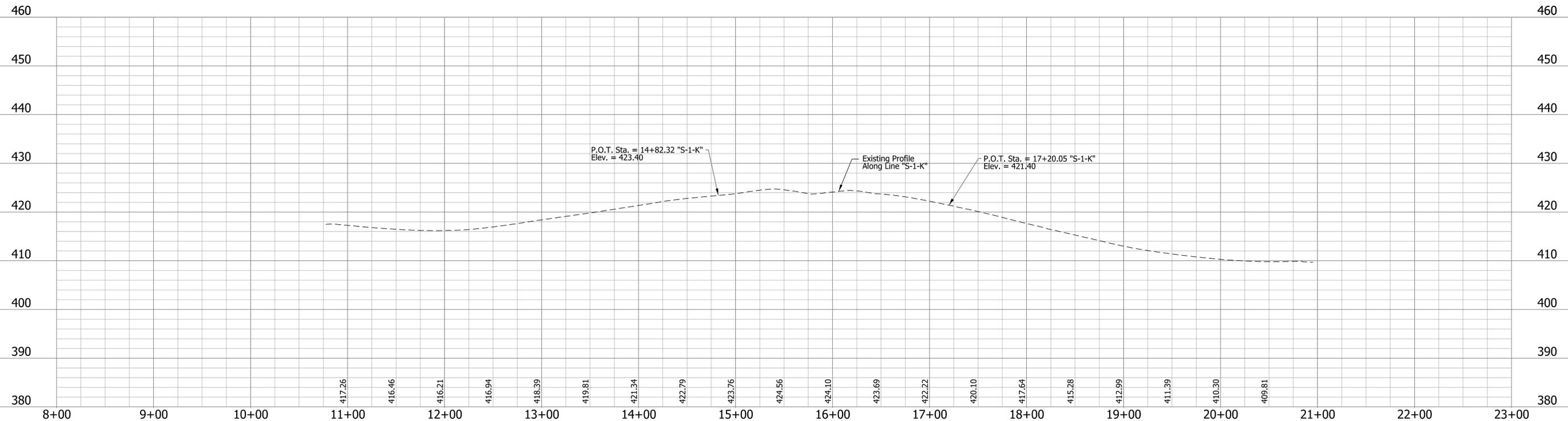
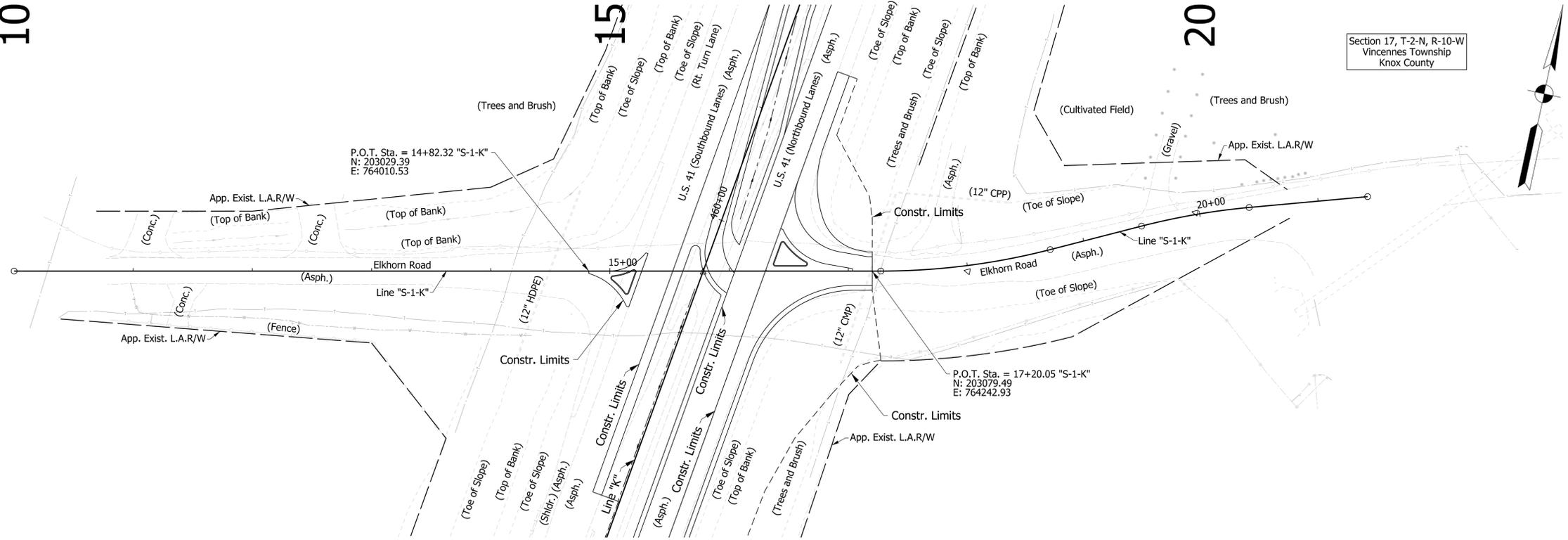
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10

15

20

Section 17, T-2-N, R-10-W  
Vincennes Township  
Knox County



Note:  
The existing profile is provided for information only. No revisions required to the profile.

**DRAFT**  
NOT FOR CONSTRUCTION

|                                |                          |            |
|--------------------------------|--------------------------|------------|
| RECOMMENDED FOR APPROVAL _____ | DESIGN ENGINEER _____    | DATE _____ |
| DESIGNED: _____ NSX _____      | DRAWN: _____ LMC _____   |            |
| CHECKED: _____ TNE _____       | CHECKED: _____ NSX _____ |            |

INDIANA  
DEPARTMENT OF TRANSPORTATION

ROADWAY PLAN AND PROFILE  
ELKHORN ROAD - LINE "S-1-K"  
STA. 10+00 TO STA. 21+00

|                  |             |        |
|------------------|-------------|--------|
| HORIZONTAL SCALE | BRIDGE FILE |        |
| 1"=50'           | N/A         |        |
| VERTICAL SCALE   | DESIGNATION |        |
| N/A              | 1800224     |        |
| SURVEY BOOK      | SHEETS      | PLN-05 |
| ELECTRONIC       | 18          | of 47  |
| CONTRACT         | PROJECT     |        |
| R-41472          | 1800224     |        |

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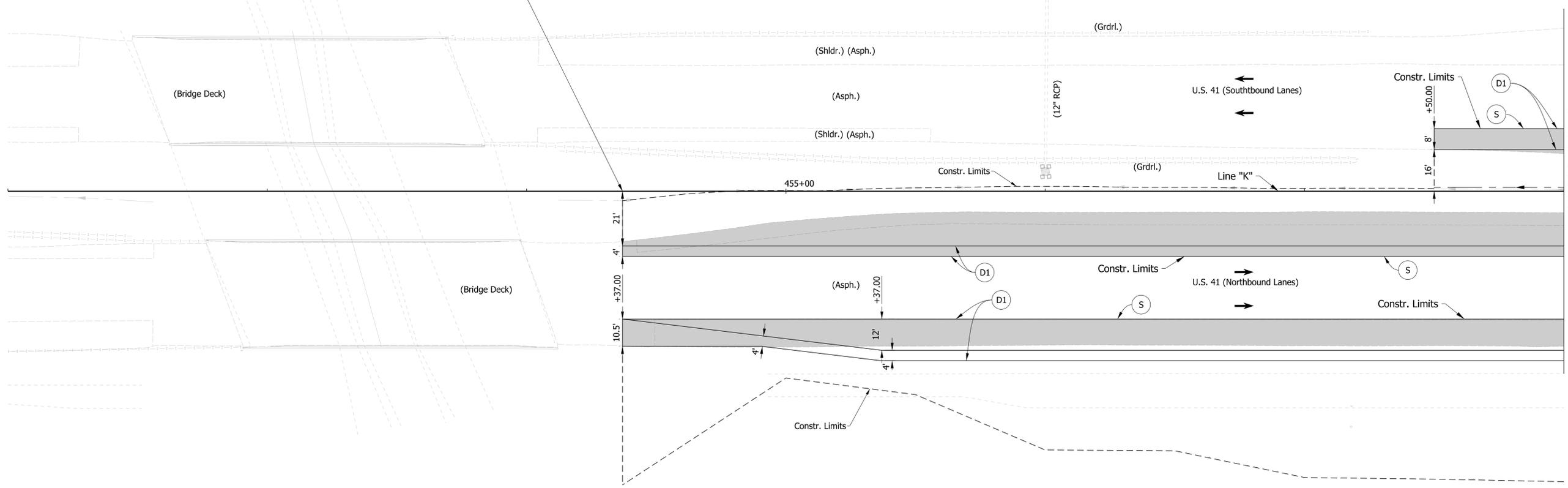
456

457

458

App. Exist. L.A.R/W

BEGIN PROJECT  
P.O.T. STA. = 454+37.00  
LINE "K"  
N: 202536.45  
E: 764133.74



Note to Reviewer: Proposed drainage layout shown in plans is preliminary and will be refined in a future submittal.

Note to Reviewer: Pavement assumed to be asphalt. Final pavement design to be determined in a future submittal.

App. Exist. L.A.R/W

- D1 165#/Svd. OC/QA-HMA, 4, 70, Surface, 9.5 mm on 275#/Svd. OC/QA-HMA, 4, 70, Intermediate, 19.0 mm on 880#/Svd. OC/QA-HMA, 4, 64, Base, 19.0 mm on 300#/Svd. OC/QA-HMA, 4, 76, Intermediate OG, 19.0 mm on 6 in of Compacted Aggregate, No. 53 on Subgrade Treatment Type IC
- S Saw Cut (No Direct Pay)

- Legend
- C PCCP, 7 In. w/"Type D-1" Construction Joint @ 18 Ft. Spacing (Typ.) on Subbase for PCCP Consisting of:  
3 In. of Compacted Aggregate, No. 8 on 6 In. of Compacted Aggregate, No. 53 on Subgrade Treatment Type IC
  - 22 Center Curb, B, Concrete (See Std. Dwg. E-605-CNCC-02)
  - Pavement Removal
  - 15 Curb & Gutter, B, Concrete (Sloping) (See Std. Dwg. E-605-CCCG-01)
  - Traffic Direction Arrow

**DRAFT**  
NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

**INDIANA DEPARTMENT OF TRANSPORTATION**

**CONSTRUCTION DETAILS**

|                  |              |
|------------------|--------------|
| HORIZONTAL SCALE | BRIDGE FILE  |
| 1"=20'           | N/A          |
| VERTICAL SCALE   | DESIGNATION  |
| N/A              | 1800224      |
| SURVEY BOOK      | SHEETS CD-01 |
| ELECTRONIC       | 19 of 47     |
| CONTRACT         | PROJECT      |
| R-41472          | 1800224      |

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458

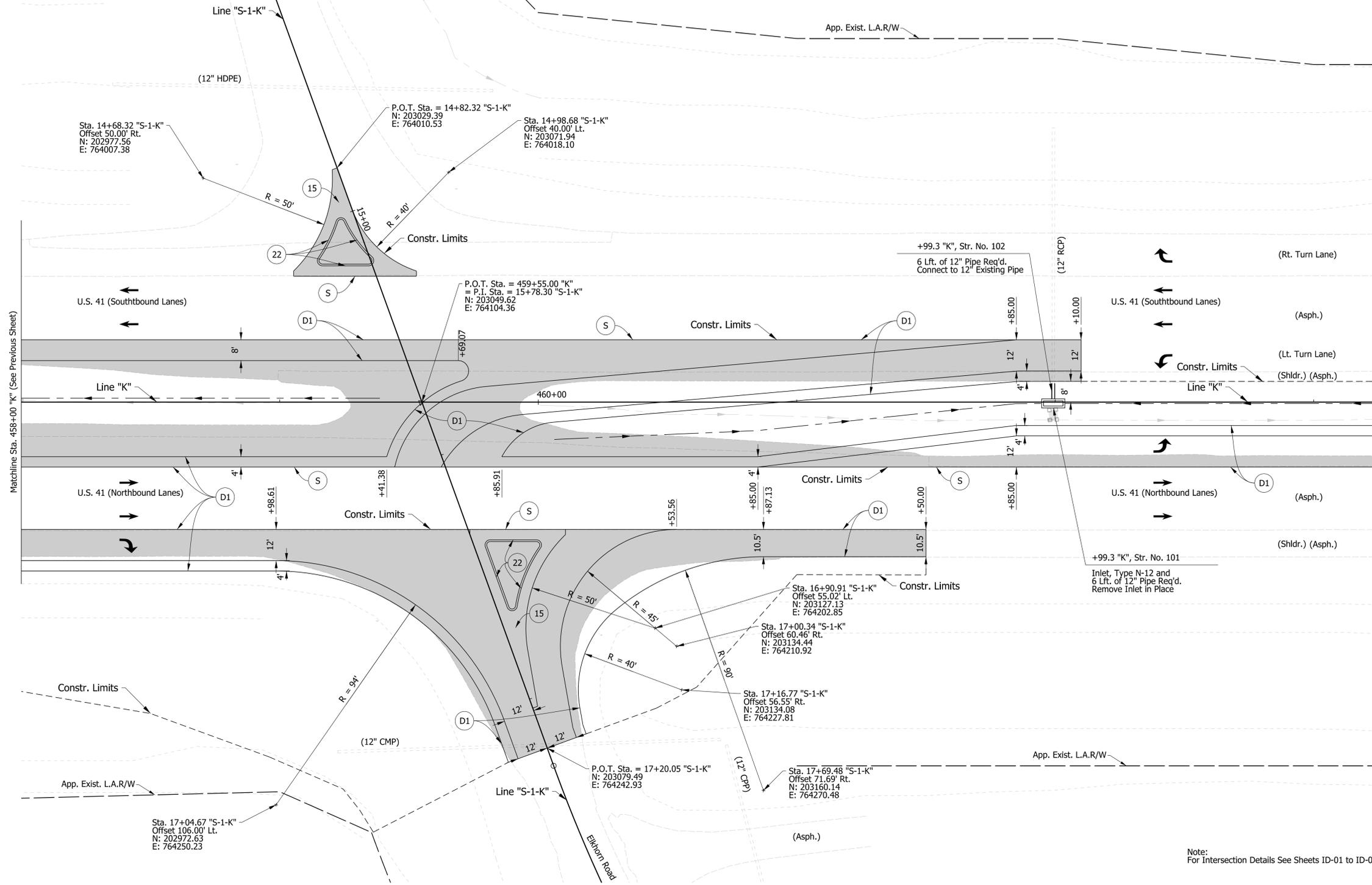
459

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461

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463



Matchline Sta. 458+00 "K" (See Previous Sheet)

Matchline Sta. 463+25 "K" (See Next Sheet)

Note to Reviewer: Proposed drainage layout shown in plans is preliminary and will be refined in a future submittal.

Note to Reviewer: Pavement assumed to be asphalt. Final pavement design to be determined in a future submittal.

Note: For Intersection Details See Sheets ID-01 to ID-04

nsxong 6/28/2020 7:31:34 am model:Sheet2 File: \\india\02\89\projects\1927-us 41 Intersections\cadd\1\cadd\1927-rd-s-cd01.dgn

| Legend                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (D1) 165#/Svd. OC/QA-HMA, 4, 70, Surface, 9.5 mm on 275#/Svd. OC/QA-HMA, 4, 70, Intermediate, 19.0 mm on 880#/Svd. OC/QA-HMA, 4, 64, Base, 19.0 mm on 300#/Svd. OC/QA-HMA, 4, 76, Intermediate OG, 19.0 mm on 6 in of Compacted Aggregate, No. 53 on Subgrade Treatment Type IC | (C) PCCP, 7 In. w/"Type D-1" Construction Joint @ 18 Ft. Spacing (Typ.) on Subbase for PCCP Consisting of: 3 In. of Compacted Aggregate, No. 8 on 6 In. of Compacted Aggregate, No. 53 on Subgrade Treatment Type IC |
| (S) Saw Cut (No Direct Pay)                                                                                                                                                                                                                                                     | (22) Center Curb, B, Concrete (See Std. Dwg. E-605-CNCC-02)                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                 | Pavement Removal                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                 | Traffic Direction Arrow                                                                                                                                                                                              |

**DRAFT**  
NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

**INDIANA DEPARTMENT OF TRANSPORTATION**

**CONSTRUCTION DETAILS**

| HORIZONTAL SCALE | BRIDGE FILE |       |
|------------------|-------------|-------|
| 1"=20'           | N/A         |       |
| VERTICAL SCALE   | DESIGNATION |       |
| N/A              | 1800224     |       |
| SURVEY BOOK      | SHEETS      | CD-02 |
| ELECTRONIC       | 20 of 47    |       |
| CONTRACT         | PROJECT     |       |
| R-41472          | 1800224     |       |

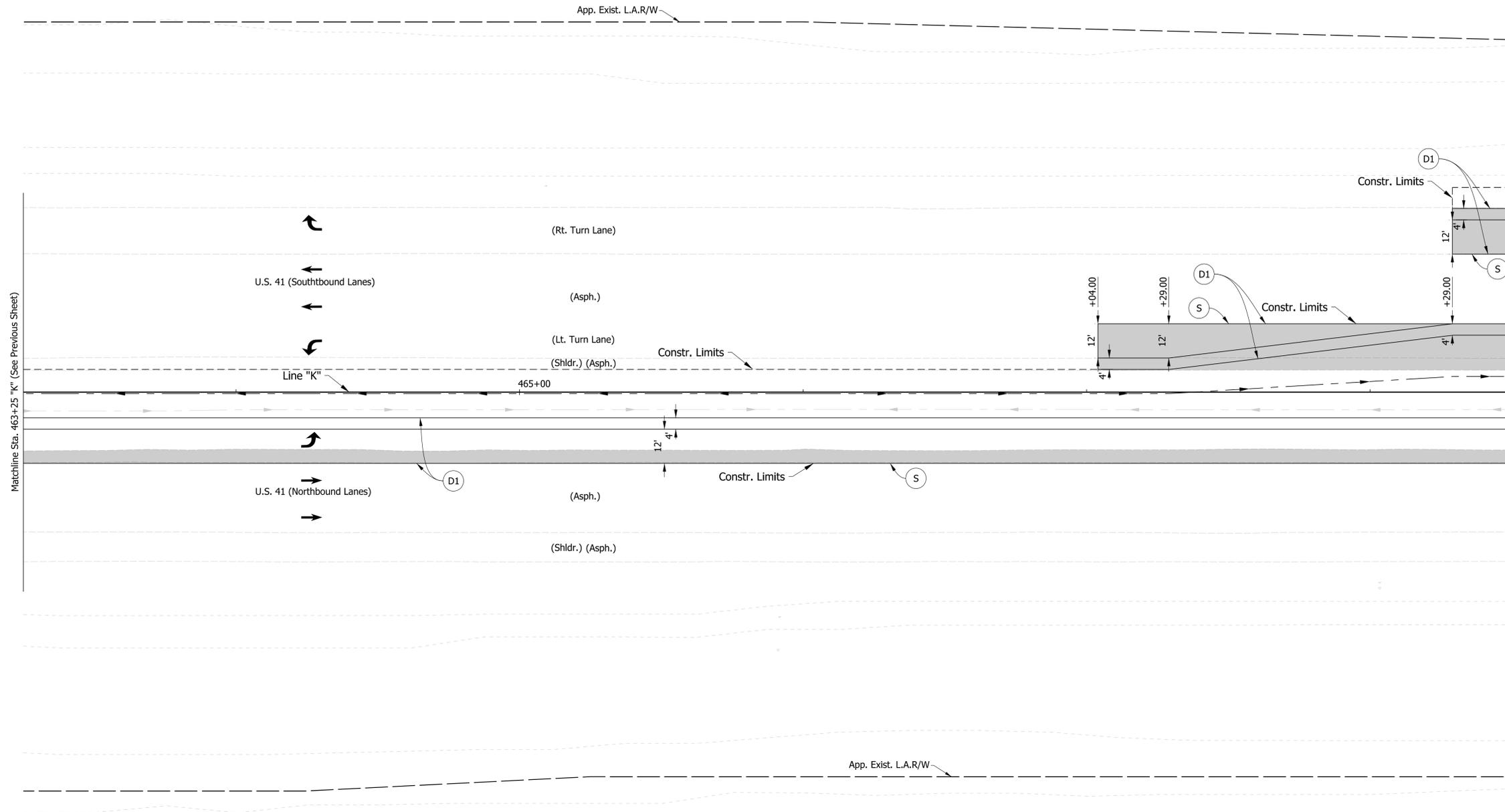
464

465

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468



Note to Reviewer: Proposed drainage layout shown in plans is preliminary and will be refined in a future submittal.

Note to Reviewer: Pavement assumed to be asphalt. Final pavement design to be determined in a future submittal.

- Legend**
- (D1) 165#/Svd. OC/QA-HMA, 4, 70, Surface, 9.5 mm on 275#/Svd. OC/QA-HMA, 4, 70, Intermediate, 19.0 mm on 880#/Svd. OC/QA-HMA, 4, 64, Base, 19.0 mm on 300#/Svd. OC/QA-HMA, 4, 76, Intermediate OG, 19.0 mm on 6 in. of Compacted Aggregate, No. 53 on Subgrade Treatment Type IC
  - (S) Saw Cut (No Direct Pay)
  - (C) PCCP, 7 In. w/"Type D-1" Construction Joint @ 18 Ft. Spacing (Typ.) on Subbase for PCCP Consisting of: 3 In. of Compacted Aggregate, No. 8 on 6 In. of Compacted Aggregate, No. 53 on Subgrade Treatment Type IC
  - (22) Center Curb, B, Concrete (See Std. Dwg. E-605-CNCC-02)
  - █ Pavement Removal
  - (15) Curb & Gutter, B, Concrete (Sloping) (See Std. Dwg. E-605-CCCG-01)
  - Traffic Direction Arrow

**DRAFT**  
NOT FOR CONSTRUCTION

|                                |                          |            |
|--------------------------------|--------------------------|------------|
| RECOMMENDED FOR APPROVAL _____ | DESIGN ENGINEER _____    | DATE _____ |
| DESIGNED: _____ NSX _____      | DRAWN: _____ LMC _____   |            |
| CHECKED: _____ TNE _____       | CHECKED: _____ NSX _____ |            |

**INDIANA DEPARTMENT OF TRANSPORTATION**

**CONSTRUCTION DETAILS**

|                  |              |
|------------------|--------------|
| HORIZONTAL SCALE | BRIDGE FILE  |
| 1"=20'           | N/A          |
| VERTICAL SCALE   | DESIGNATION  |
| N/A              | 1800224      |
| SURVEY BOOK      | SHEETS CD-03 |
| ELECTRONIC       | 21 of 47     |
| CONTRACT         | PROJECT      |
| R-41472          | 1800224      |

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 file: \\india\0289\projects\19927-us 41 Intersections\Cadd\h\cads\19927-rd-s-cd01.dgn

469

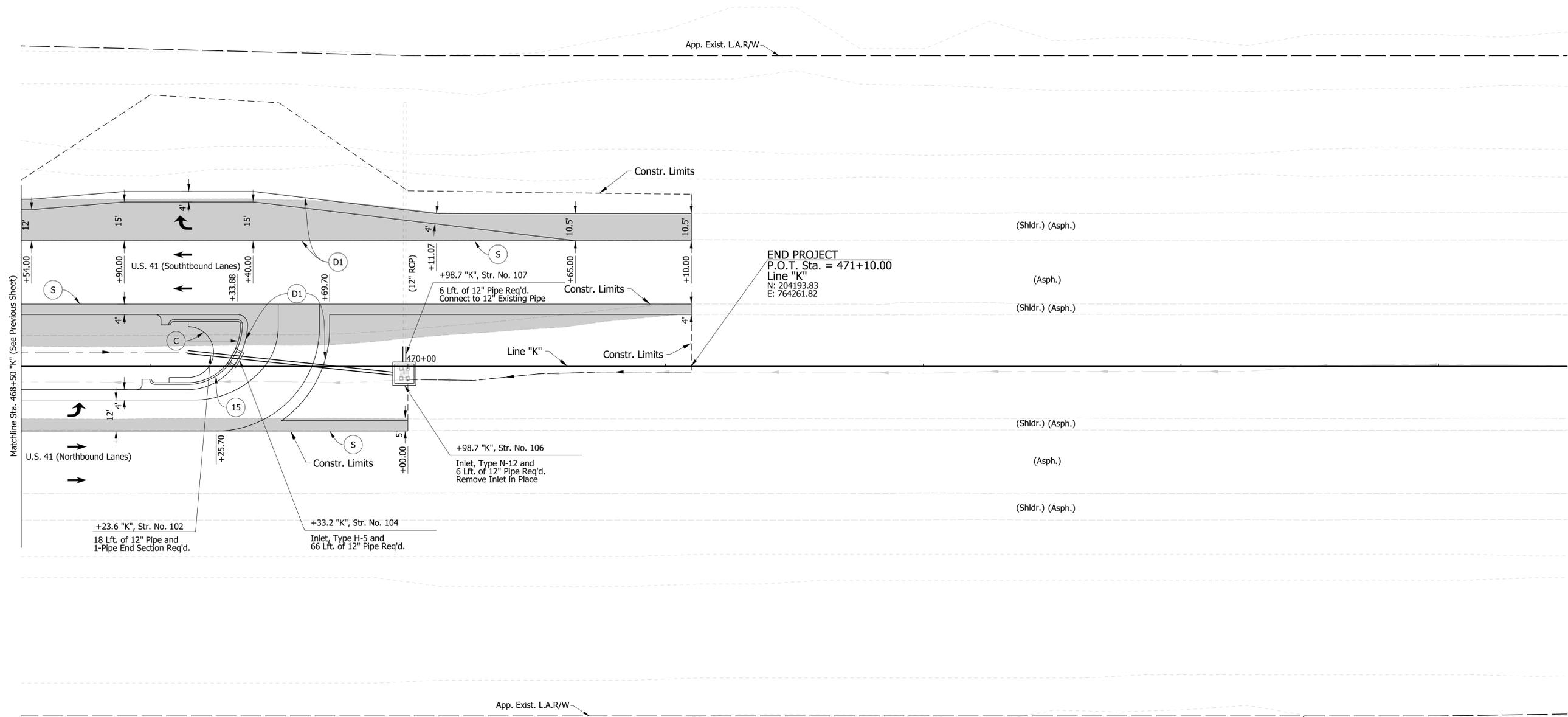
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END PROJECT  
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 E: 764261.82

Note to Reviewer: Proposed drainage layout shown in plans is preliminary and will be refined in a future submittal.

Note to Reviewer: Pavement assumed to be asphalt. Final pavement design to be determined in a future submittal.

Note:  
 For Intersection Details See Sheets ID-01 to ID-04

- Legend**
- (D1) 165#/Svd. OC/QA-HMA, 4, 70, Surface, 9.5 mm on 275#/Svd. OC/QA-HMA, 4, 70, Intermediate, 19.0 mm on 880#/Svd. OC/QA-HMA, 4, 64, Base, 19.0 mm on 300#/Svd. OC/QA-HMA, 4, 76, Intermediate OG, 19.0 mm on 6 in of Compacted Aggregate, No. 53 on Subgrade Treatment Type IC
  - (S) Saw Cut (No Direct Pay)
  - (C) PCCP, 7 In. w/"Type D-1" Construction Joint @ 18 Ft. Spacing (Typ.) on Subbase for PCCP Consisting of: 3 In. of Compacted Aggregate, No. 8 on 6 In. of Compacted Aggregate, No. 53 on Subgrade Treatment Type IC
  - (22) Center Curb, B, Concrete (See Std. Dwg. E-605-CNCC-02)
  - █ Pavement Removal
  - ➔ Traffic Direction Arrow

**DRAFT**  
 NOT FOR CONSTRUCTION

|                          |                 |      |
|--------------------------|-----------------|------|
| RECOMMENDED FOR APPROVAL | DESIGN ENGINEER | DATE |
| DESIGNED: NSX            | DRAWN: LMC      |      |
| CHECKED: TNE             | CHECKED: NSX    |      |

**INDIANA DEPARTMENT OF TRANSPORTATION**

**CONSTRUCTION DETAILS**

|                  |              |
|------------------|--------------|
| HORIZONTAL SCALE | BRIDGE FILE  |
| 1"=20'           | N/A          |
| VERTICAL SCALE   | DESIGNATION  |
| N/A              | 1800224      |
| SURVEY BOOK      | SHEETS CD-04 |
| ELECTRONIC       | 22 of 47     |
| CONTRACT         | PROJECT      |
| R-41472          | 1800224      |

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 model:Sheet4  
 file: \\india\02\89\projects\1927-us 41 Intersections\Cadd\h\cads\1927-rd-s-cd01.dgn

## APPENDIX C: EARLY COORDINATION



August 6, 2020

Rickie Clark  
Manager, Public Involvement  
Indiana Department of Transportation  
100 N. Senate Avenue Room 642  
Indianapolis, IN 46204

Sample Early Coordination Letter

Via Email: rclark@indot.in.gov

Re: Early Coordination Letter  
Des. No. 1800224  
US 41 at Elkhorn Road, Intersection Improvement Project  
Knox County, Indiana

Dear Mr. Clark,

The Indiana Department of Transportation (INDOT) and Federal Highway Administration (FHWA) intend to proceed with a project involving the intersection of US 41 with Elkhorn Road in Knox County, Indiana. This letter is part of the early coordination phase of the environmental review process. We request comments from you within your area of expertise regarding any potential environmental or community effects associated with this proposed project. **Please use the above designation number and description in your reply.** We will incorporate your comments into a study of the project's environmental effects.

**Project Location:** This project is located at the intersection of US 41 with Elkhorn Road, south of Vincennes, in Knox County. More specifically, the project is located in Common Lots "C", in Vincennes Township, Indiana.

**Existing Conditions:** The intersection of US 41 with Elkhorn Road is unsignalized, with free-flowing north-south traffic on US 41 and stop controls at the east and west approaches. US 41 is a four-lane principle arterial. The northbound approach to the intersection has a dedicated left-turn lane, one through lane, one shared through/right turn lane, and is separated from the southbound lanes by a 40-foot grass median. The southbound approach has a dedicated left turn lane, a dedicated right turn lane, and two through lanes. The posted speed on US 41 is 60 mph. Elkhorn Road is a two lane major collector east of US 41 and a local road west of US 41. Both the eastbound and westbound approaches have a shared left turn/through lane/right turn lane. There is no posted speed on Elkhorn Road approaching the intersection, however, a future proposed project plans to post the speed east of US 41 at 40 mph.

**Purpose and Need:** The purpose of the project is to improve safety at this intersection. The need for the project is due to the high number of crashes, particularly from westbound traffic with southbound traffic, that occur at this intersection. Given the planned development in the area, traffic is expected to increase, which would result in a corresponding increase in crash incidents should improvements not be made.

**Proposed Project:** Proposed activities include construction of a median U-turn for northbound US 41 to the north of the intersection of US 41 and Elkhorn Road, and the removal of the existing northbound left turn lane at Elkhorn Road. Elkhorn Road west of US 41 will be modified to a right-in/right-out for US 41 southbound traffic. A northbound right turn lane from US 41 to Elkhorn Road will be added. Additional project activities will include the construction of center curbs where Elkhorn Road intersects US 41, installation of new signage, and installation of street lighting.

**Right-of-Way:** There will be no right-of-way acquisition for this project.

**Maintenance of Traffic (MOT):** During construction, traffic will be maintained with in two stages. First, median left turn lanes and U-turns will be constructed, with the existing intersection open to traffic; in the second stage, the intersection will be closed and the U-turns utilized.

**Surrounding Resources:** Land use in the vicinity of the project is a mix agricultural, residential, and commercial. There is a developing business park at the southeast corner of the intersection, and there are residences at the northwest and northeast corners. The greater surrounding area is primarily dedicated to agricultural uses.

A waters/wetland determination will be performed and possible wetlands delineation. A Waters of the US Report will summarize the findings. All applicable permits will be obtained before construction begins. The project is not in a wellhead protection area. The northern portion of the project is located in the Vincennes Urban Area Boundary (UAB) which serves as a Municipal Separate Storm Sewer System (MS4) entity. Post Construction Best Management Practices may need to be considered for this project.

This project qualifies for the application of the United States Fish and Wildlife Service (USFWS) range-wide programmatic informal consultation for the Indiana bat and northern long-eared bat. The USFWS Information, Planning, and Consultation System (IPaC) will be utilized to determine the project's potential to affect the Indiana bat and northern long-eared bat. A review of the USFWS database did not indicate the presence of endangered bat species in or within 0.5 mile of the project area.

**Comments Request:** You are asked to review this information and provide any comments you may have relative to the anticipated effects of the project on areas which you have jurisdiction or special expertise. Please send your comments to Susan Harrington, of HNTB Corporation, at [sharrington@hntb.com](mailto:sharrington@hntb.com) or 317-917-5233. Should we not receive your response **within thirty (30) calendar days** from the date of this letter, it will be assumed that your agency feels that there will be no adverse effects incurred as a result of the proposed project. However, should you find that an extension to the response time is necessary; a reasonable amount may be granted upon request.

If you have any questions regarding this matter, please feel free to contact Susan Harrington, HNTB, [sharrington@hntb.com](mailto:sharrington@hntb.com), 317-917-5233, or Troy Arnold, INDOT Project Manager, [tarnold@indot.in.gov](mailto:tarnold@indot.in.gov), 812-895-7348 ext. 14669. Thank you in advance for your input.

Sincerely,

HNTB CORPORATION



Susan Harrington  
Scientist III

Attachments were removed to avoid duplication. Graphics can be found in Appendix B.

Attachments: Figure 1: Project Location Map  
Figure 2: Project Aerial Map  
Figure 3: USGS 7.5 Minute Topographic Quad Map  
Figure 4: Photo Location Map  
Project Location Photographs

Cc: Troy Arnold, INDOT Project Manager  
Susan Harrington, HNTB  
Richard Vermillion, Knox County Surveyor  
Colt Michaels, Floodplain Administrator  
Hunter Pinnell, MS4 Coordinator  
Doug Vantlin, Knox County Sheriff  
Benji Boyd, Knox County Highway Department  
Vincennes Township Fire Department  
Kellie Streeter, Knox County Board of Commissioners  
Robert Lechner, Knox County Council  
Rickie Clark, INDOT Office of Public Involvement  
Indiana Department of Environmental Management, via webform  
Indiana Geological Survey, via webform  
Christie Stanifer, Indiana Department of Natural Resources  
Erica Tait, Federal Highway Administration  
Robin McWilliams-Munson, US Fish and Wildlife Service  
Ryan Falls, INDOT Vincennes District

Sent to Toth Enterprises of Indiana, LLC on 9/10/2020

## Sharon Anton

---

**From:** Falls, Ryan G <RFalls@indot.IN.gov>  
**Sent:** Monday, August 10, 2020 10:45 AM  
**To:** Sharon Anton  
**Cc:** Richard Connolly; Susan Harrington; Arnold, Troy  
**Subject:** RE: Vincennes Early Coordination Response - US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224)

Sharon Anton,

At this time, our office has no comment on this project. Thank you for the opportunity to respond to early coordination.

### Ryan Falls

#### *Capital Program Management-Senior Environmental Manager Supervisor*

Indiana Department of Transportation  
3650 South US Highway 41  
Vincennes, IN 47591

**Office:** 812-895-7326

**Cell:** 812-582-1387

**Email:** [rfalls@indot.IN.gov](mailto:rfalls@indot.IN.gov)



---

**From:** Sharon Anton <santon@HNTB.com>  
**Sent:** Thursday, August 6, 2020 4:20 PM  
**To:** Falls, Ryan G <RFalls@indot.IN.gov>  
**Cc:** Richard Connolly <rconnolly@HNTB.com>; Susan Harrington <sharrington@HNTB.com>; Arnold, Troy <TArnold1@indot.IN.gov>  
**Subject:** Early Coordination Letter - US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224)

\*\*\*\* This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. \*\*\*\*

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Dear Mr. Falls,

Please see the attached early coordination letter and supporting graphics for the US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224).

If you have any questions regarding this project, please feel free to contact me by phone or email.

Best regards,

### Sharon Anton

Scientist I  
Environmental Planning  
Tel (317) 917-5275 Email [santon@hntb.com](mailto:santon@hntb.com)

**HNTB CORPORATION**

## Sharon Anton

---

**From:** McWilliams, Robin <robin\_mcwilliams@fws.gov>  
**Sent:** Tuesday, August 25, 2020 11:44 AM  
**To:** Sharon Anton  
**Subject:** Re: [EXTERNAL] Early Coordination Letter - US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224)

Dear Ms. Anton,

This responds to your recent letter requesting our comments on the aforementioned project.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et. seq.) and are consistent with the intent of the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the U. S. Fish and Wildlife Service's Mitigation Policy.

The project is within the range of the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) and should follow the new Indiana bat/northern long-eared bat programmatic consultation process, if applicable (i.e. a federal transportation nexus is established). The Service has 14 days after a "Not Likely to Adversely Affect" determination letter is generated to review the project and provide additional comments or request additional information; if you do not receive a response from us within 14 days, we have no additional comments.

Based on a review of the information you provided, the U.S. Fish and Wildlife Service has no other comments on the project as currently proposed. However, should new information arise pertaining to project plans or a revised species list be published, it will be necessary for the Federal agency to reinitiate consultation. Standard recommendations are provided below.

We appreciate the opportunity to comment at this early stage of project planning. If you have any questions about our recommendations, please call (812) 334-4261 x. 207.

Sincerely,  
Robin McWilliams Munson

### **Standard Recommendations:**

1. Do not clear trees or understory vegetation outside the construction zone boundaries. **(This restriction is not related to the "tree clearing" restriction for potential Indiana Bat habitat.)**
2. Restrict below low-water work in streams to placement of culverts, piers, pilings and/or footings, shaping of the spill slopes around the bridge abutments, and placement of riprap. Culverts should span the active stream channel, should be either embedded or a 3-sided or open-arch culvert, and be installed where practicable on an essentially flat slope. When an open-bottom culvert or arch is used in a stream, which has a good natural bottom substrate, such as gravel, cobbles and boulders, the existing substrate should be left undisturbed beneath the culvert to provide natural habitat for the aquatic community.
3. Restrict channel work and vegetation clearing to the minimum necessary for installation of the stream crossing structure.

4. Minimize the extent of hard armor (riprap) in bank stabilization by using bioengineering techniques whenever possible. If riprap is utilized for bank stabilization, extend it below low-water elevation to provide aquatic habitat.
5. Implement temporary erosion and sediment control methods within areas of disturbed soil. All disturbed soil areas upon project completion will be vegetated following INDOT's standard specifications.
6. Avoid all work within the inundated part of the stream channel (in perennial streams and larger intermittent streams) during the fish spawning season (April 1 through June 30), except for work within sealed structures such as caissons or cofferdams that were installed prior to the spawning season. No equipment shall be operated below Ordinary High Water Mark during this time unless the machinery is within the caissons or on the cofferdams.
7. Evaluate wildlife crossings under bridge/culverts projects in appropriate situations. Suitable crossings include flat areas below bridge abutments with suitable ground cover, high water shelves in culverts, amphibian tunnels and diversion fencing

Robin McWilliams Munson  
Fish and Wildlife Biologist  
U.S. Fish and Wildlife Service  
620 South Walker Street  
Bloomington, IN 46142  
812-334-4261

Mon-Tues 8-3:30p  
Wed-Thurs 8:30-3p Telework

---

**From:** Sharon Anton <santon@HNTB.com>  
**Sent:** Thursday, August 6, 2020 4:19 PM  
**To:** McWilliams, Robin <robin\_mcwilliams@fws.gov>  
**Subject:** [EXTERNAL] Early Coordination Letter - US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224)

**This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.**

Dear Ms. McWilliams-Munson,

Please see the attached early coordination letter and supporting graphics for the US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224).

If you have any questions regarding this project, please feel free to contact me by phone or email.

Best regards,

**Sharon Anton**  
Scientist I  
Environmental Planning  
Tel (317) 917-5275 Email [santon@hntb.com](mailto:santon@hntb.com)

**HNTB CORPORATION**  
111 Monument Circle, Suite 1200, Indianapolis, Indiana 46204 | [hntb.com](http://hntb.com)

 **100+ YEARS OF INFRASTRUCTURE SOLUTIONS**



INDIANA  
GEOLOGICAL SURVEY

## Organization and Project Information

**Project ID:**  
**Des. ID:** 1800224  
**Project Title:** US 41 at Elkhorn Road Intersection Improvements  
**Name of Organization:** HNTB Indiana  
**Requested by:** Sharon Anton

## Environmental Assessment Report

### 1. Geological Hazards:

- Moderate liquefaction potential
- 1% Annual Chance Flood Hazard

### 2. Mineral Resources:

- Bedrock Resource: Low Potential
- Sand and Gravel Resource: High Potential

### 3. Active or abandoned mineral resources extraction sites:

- None documented in the area

\*All map layers from Indiana Map ([maps.indiana.edu](http://maps.indiana.edu))

### DISCLAIMER:

This document was compiled by Indiana University, Indiana Geological Survey, using data believed to be accurate; however, a degree of error is inherent in all data. This product is distributed "AS-IS" without warranties of any kind, either expressed or implied, including but not limited to warranties of suitability to a particular purpose or use. No attempt has been made in either the design or production of these data and document to define the limits or jurisdiction of any federal, state, or local government. The data used to assemble this document are intended for use only at the published scale of the source data or smaller (see the metadata links below) and are for reference purposes only. They are not to be construed as a legal document or survey instrument. A detailed on-the-ground survey and historical analysis of a single site may differ from these data and this document.

This information was furnished by Indiana Geological Survey

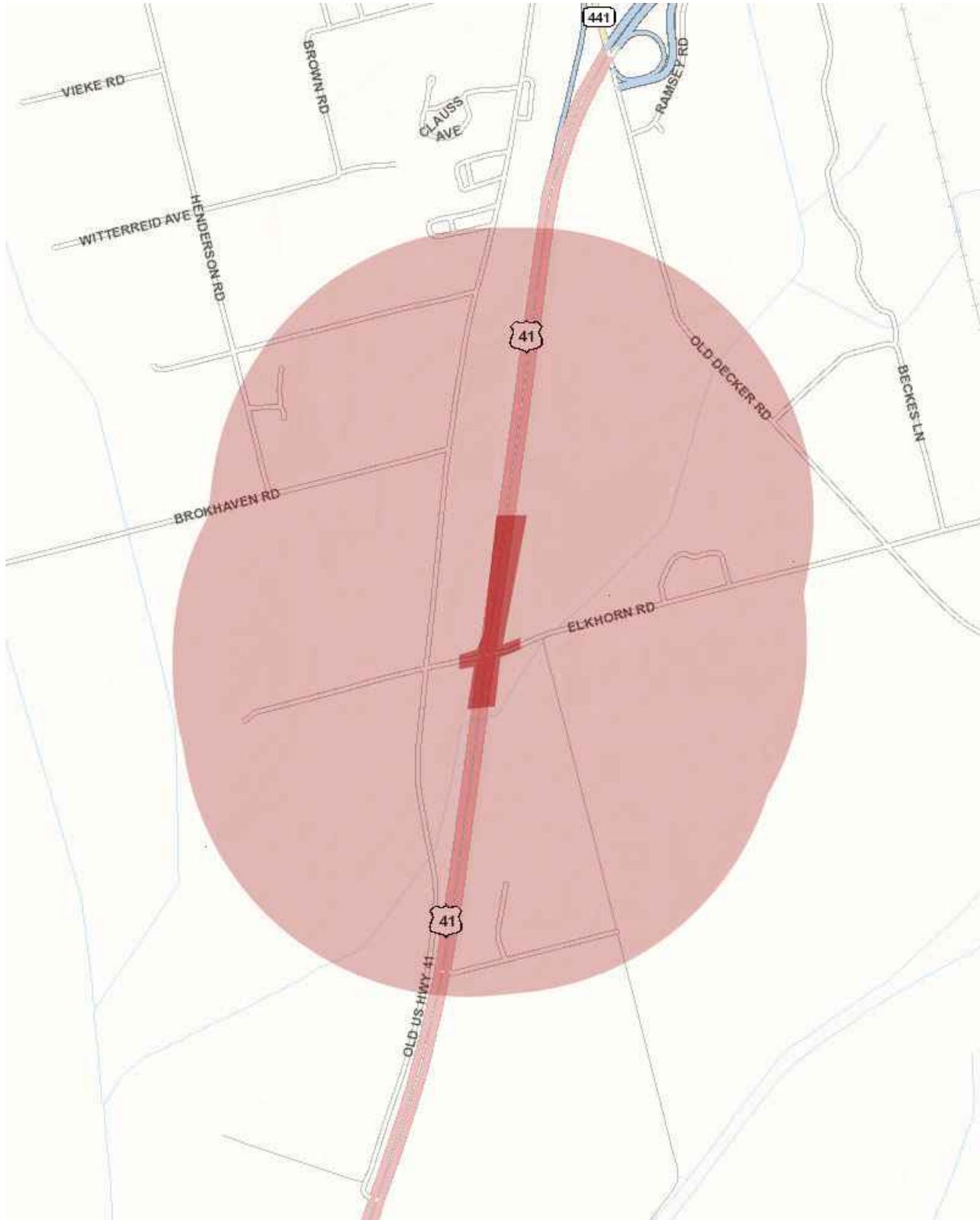
Address: 420 N. Walnut St., Bloomington, IN 47404

Email: [IGSEnvir@indiana.edu](mailto:IGSEnvir@indiana.edu)

Phone: 812 855-7428

Date: August 31, 2020







## Metadata:

- [https://maps.indiana.edu/metadata/Geology/Seismic\\_Earthquake\\_Liquefaction\\_Potential.html](https://maps.indiana.edu/metadata/Geology/Seismic_Earthquake_Liquefaction_Potential.html)
- [https://maps.indiana.edu/metadata/Geology/Industrial\\_Minerals\\_Sand\\_Gravel\\_Resources.html](https://maps.indiana.edu/metadata/Geology/Industrial_Minerals_Sand_Gravel_Resources.html)
- [https://maps.indiana.edu/metadata/Hydrology/Floodplains\\_FIRM.html](https://maps.indiana.edu/metadata/Hydrology/Floodplains_FIRM.html)
- [https://maps.indiana.edu/metadata/Geology/Bedrock\\_Geology.html](https://maps.indiana.edu/metadata/Geology/Bedrock_Geology.html)



# Indiana Department of Environmental Management

*We Protect Hoosiers and Our Environment.*

100 North Senate Avenue - Indianapolis, IN 46204  
(800) 451-6027 - (317) 232-8603 - [www.idem.IN.gov](http://www.idem.IN.gov)

INDOT  
Troy Arnold  
3650 S US Highway 41  
Vincennes , IN 47591

HNTB Corporation  
Sharon Anton  
111 Monument Circle  
Suite 1200  
Indianapolis , IN 46204

Date : 9/14/2020

To Engineers and Consultants Proposing Roadway Construction Projects:

RE: The Federal Highway Administration (FHWA) and Indiana Department of Transportation (INDOT) intend to proceed with an intersection improvements project at intersection of US 41 and Elkhorn Road, located approximately 1 mile south of Vincennes, Indiana. Proposed activities include construction of a Reduced Conflict Intersection (RCI) for northbound US 41 to the north of the intersection of US 41 and Elkhorn Road, and the removal of the existing northbound left turn lane at Elkhorn Road. Elkhorn Road west of US 41 will be modified to a right-in/right-out for US 41 southbound traffic. A northbound right turn lane from US 41 to Elkhorn Road will be added. Additional project activities include the construction of center curbs where Elkhorn Road intersects US 41, installation of new signage, and the installation of street lighting.

This letter from the Indiana Department of Environmental Management (IDEM) serves as a standardized response to enquiries inviting IDEM comments on roadway construction, reconstruction, or other improvement projects within existing roadway corridors when the proposed scope of the project is beneath the threshold requiring a formal National Environmental Policy Act-mandated Environmental Assessment or Environmental Impact Statement. As the letter attempts to address all roadway-related environmental topics of potential concern, it is possible that not every topic addressed in the letter will be applicable to your particular roadway project.

For additional information on specific roadway-related topics of interest, please visit the appropriate Web pages cited below, many of which provide contact information for persons within the various program areas who can answer questions not fully addressed in this letter. Also please be mindful that some environmental requirements may be subject to change and so each person intending to include a copy of this letter in their project documentation packet is advised to download the most recently revised version of the letter; found at: <http://www.in.gov/idem/5283.htm> (<http://www.in.gov/idem/5283.htm>).

To ensure that all environmentally-related issues are adequately addressed, IDEM recommends that you read this letter in its entirety, and consider each of the following issues as you move forward with the planning of your proposed roadway construction, reconstruction, or improvement project:

## WATER AND BIOTIC QUALITY

1. Section 404 of the Clean Water Act requires that you obtain a permit from the U.S. Army Corps of Engineers (USACE) before discharging dredged or fill materials into any wetlands or other waters, such as rivers, lakes, streams, and ditches. Other activities regulated include the relocation, channelization, widening, or

other such alteration of a stream, and the mechanical clearing (use of heavy construction equipment) of wetlands. Thus, as a project owner or sponsor, it is your responsibility to ensure that no wetlands are disturbed without the proper permit. Although you may initially refer to the U.S. Fish and Wildlife Service National Wetland Inventory maps as a means of identifying potential areas of concern, please be mindful that those maps do not depict jurisdictional wetlands regulated by the USACE or the Department of Environmental Management. A valid jurisdictional wetlands determination can only be made by the USACE, using the 1987 Wetland Delineation Manual.

USACE recommends that you have a consultant check to determine whether your project will abut, or lie within, a wetland area. To view a list of consultants that have requested to be included on a list posted by the USACE on their Web site, see USACE Permits and Public Notices (<http://www.lrl.usace.army.mil/orf/default.asp>) (<http://www.lrl.usace.army.mil/orf/default.asp>) and then click on "Information" from the menu on the right-hand side of that page. Their "Consultant List" is the fourth entry down on the "Information" page. Please note that the USACE posts all consultants that request to appear on the list, and that inclusion of any particular consultant on the list does not represent an endorsement of that consultant by the USACE, or by IDEM.

Much of northern Indiana (Newton, Lake, Porter, LaPorte, St. Joseph, Elkhart, LaGrange, Steuben, and Dekalb counties; large portions of Jasper, Starke, Marshall, Noble, Allen, and Adams counties; and lesser portions of Benton, White, Pulaski, Kosciusko, and Wells counties) is served by the USACE District Office in Detroit (313-226-6812). The central and southern portions of the state (large portions of Benton, White, Pulaski, Kosciusko, and Wells counties; smaller portions of Jasper, Starke, Marshall, Noble, Allen, and Adams counties; and all other Indiana counties located in north-central, central, and southern Indiana) are served by the USACE Louisville District Office (502-315-6733).

Additional information on contacting these U.S. Army Corps of Engineers (USACE) District Offices, government agencies with jurisdiction over wetlands, and other water quality issues, can be found at <http://www.in.gov/idem/4396.htm> (<http://www.in.gov/idem/4396.htm>). IDEM recommends that impacts to wetlands and other water resources be avoided to the fullest extent.

2. In the event a Section 404 wetlands permit is required from the USACE, you also must obtain a Section 401 Water Quality Certification from the IDEM Office of Water Quality Wetlands Program. To learn more about the Wetlands Program, visit: <http://www.in.gov/idem/4384.htm> (<http://www.in.gov/idem/4384.htm>).
3. If the USACE determines that a wetland or other water body is isolated and not subject to Clean Water Act regulation, it is still regulated by the state of Indiana. A State Isolated Wetland permit from IDEM's Office of Water Quality (OWQ) is required for any activity that results in the discharge of dredged or fill materials into isolated wetlands. To learn more about isolated wetlands, contact the OWQ Wetlands Program at 317-233-8488.
4. If your project will involve over a 0.5 acre of wetland impact, stream relocation, or other large-scale alterations to water bodies such as the creation of a dam or a water diversion, you should seek additional input from the OWQ Wetlands Program staff. Consult the Web at: <http://www.in.gov/idem/4384.htm> (<http://www.in.gov/idem/4384.htm>) for the appropriate staff contact to further discuss your project.
5. Work within the one-hundred year floodway of a given water body is regulated by the Department of Natural Resources, Division of Water. The Division issues permits for activities regulated under the follow statutes:
  - o IC 14-26-2 Lakes Preservation Act 312 IAC 11
  - o IC 14-26-5 Lowering of Ten Acre Lakes Act No related code
  - o IC 14-28-1 Flood Control Act 310 IAC 6-1

- IC 14-29-1 Navigable Waterways Act 312 IAC 6
- IC 14-29-3 Sand and Gravel Permits Act 312 IAC 6
- IC 14-29-4 Construction of Channels Act No related code

For information on these Indiana (statutory) Code and Indiana Administrative Code citations, see the DNR Web site at: <http://www.in.gov/dnr/water/9451.htm> (<http://www.in.gov/dnr/water/9451.htm>) . Contact the DNR Division of Water at 317-232-4160 for further information.

The physical disturbance of the stream and riparian vegetation, especially large trees overhanging any affected water bodies should be limited to only that which is absolutely necessary to complete the project. The shade provided by the large overhanging trees helps maintain proper stream temperatures and dissolved oxygen for aquatic life.

6. For projects involving construction activity (which includes clearing, grading, excavation and other land disturbing activities) that result in the disturbance of one (1), or more, acres of total land area, contact the Office of Water Quality – Watershed Planning Branch (317/233-1864) regarding the need for of a Rule 5 Storm Water Runoff Permit. Visit the following Web page
  - <http://www.in.gov/idem/4902.htm> (<http://www.in.gov/idem/4902.htm>)

To obtain, and operate under, a Rule 5 permit you will first need to develop a Construction Plan (<http://www.in.gov/idem/4917.htm#constreq> (<http://www.in.gov/idem/4917.htm#constreq>)), and as described in 327 IAC 15-5-6.5 (<http://www.in.gov/legislative/iac/T03270/A00150> [PDF] (<http://www.in.gov/legislative/iac/T03270/A00150.PDF>), pages 16 through 19). Before you may apply for a Rule 5 Permit, or begin construction, you must submit your Construction Plan to your county Soil and Water Conservation District (SWCD) (<http://www.in.gov/isda/soil/contacts/map.html> (<http://www.in.gov/isda/soil/contacts/map.html>)).

Upon receipt of the construction plan, personnel of the SWCD or the Indiana Department of Environmental Management will review the plan to determine if it meets the requirements of 327 IAC 15-5. Plans that are deemed deficient will require re-submittal. If the plan is sufficient you will be notified and instructed to submit the verification to IDEM as part of the Rule 5 Notice of Intent (NOI) submittal. Once construction begins, staff of the SWCD or Indiana Department of Environmental Management will perform inspections of activities at the site for compliance with the regulation.

Please be mindful that approximately 149 Municipal Separate Storm Sewer System (MS4) areas are now being established by various local governmental entities throughout the state as part of the implementation of Phase II federal storm water requirements. All of these MS4 areas will eventually take responsibility for Construction Plan review, inspection, and enforcement. As these MS4 areas obtain program approval from IDEM, they will be added to a list of MS4 areas posted on the IDEM Website at: <http://www.in.gov/idem/4900.htm> (<http://www.in.gov/idem/4900.htm>).

If your project is located in an IDEM-approved MS4 area, please contact the local MS4 program about meeting their storm water requirements. Once the MS4 approves the plan, the NOI can be submitted to IDEM.

Regardless of the size of your project, or which agency you work with to meet storm water requirements, IDEM recommends that appropriate structures and techniques be utilized both during the construction phase, and after completion of the project, to minimize the impacts associated with storm water runoff. The use of appropriate planning and site development and appropriate storm water quality measures are recommended to prevent soil from leaving the construction site during active land disturbance and for post construction water quality concerns. Information and assistance regarding storm water related to

construction activities are available from the Soil and Water Conservation District (SWCD) offices in each county or from IDEM.

7. For projects involving impacts to fish and botanical resources, contact the Department of Natural Resources - Division of Fish and Wildlife (317/232-4080) for addition project input.
8. For projects involving water main construction, water main extensions, and new public water supplies, contact the Office of Water Quality - Drinking Water Branch (317-308-3299) regarding the need for permits.
9. For projects involving effluent discharges to waters of the State of Indiana, contact the Office of Water Quality - Permits Branch (317-233-0468) regarding the need for a National Pollutant Discharge Elimination System (NPDES) permit.
10. For projects involving the construction of wastewater facilities and sewer lines, contact the Office of Water Quality - Permits Branch (317-232-8675) regarding the need for permits.

## AIR QUALITY

The above-noted project should be designed to minimize any impact on ambient air quality in, or near, the project area. The project must comply with all federal and state air pollution regulations. Consideration should be given to the following:

1. Regarding open burning, and disposing of organic debris generated by land clearing activities; some types of open burning are allowed (<http://www.in.gov/idem/4148.htm> (<http://www.in.gov/idem/4148.htm>)) under specific conditions. You also can seek an open burning variance from IDEM.

However, IDEM generally recommends that you take vegetative wastes to a registered yard waste composting facility or that the waste be chipped or shredded with composting on site (you must register with IDEM if more than 2,000 pounds is to be composted; contact 317/232-0066). The finished compost can then be used as a mulch or soil amendment. You also may bury any vegetative wastes (such as leaves, twigs, branches, limbs, tree trunks and stumps) onsite, although burying large quantities of such material can lead to subsidence problems, later on.

Reasonable precautions must be taken to minimize fugitive dust emissions from construction and demolition activities. For example, wetting the area with water, constructing wind barriers, or treating dusty areas with chemical stabilizers (such as calcium chloride or several other commercial products). Dirt tracked onto paved roads from unpaved areas should be minimized.

Additionally, if construction or demolition is conducted in a wooded area where blackbirds have roosted or abandoned buildings or building sections in which pigeons or bats have roosted for 3-5 years precautionary measures should be taken to avoid an outbreak of histoplasmosis. This disease is caused by the fungus *Histoplasma capsulatum*, which stems from bird or bat droppings that have accumulated in one area for 3-5 years. The spores from this fungus become airborne when the area is disturbed and can cause infections over an entire community downwind of the site. The area should be wetted down prior to cleanup or demolition of the project site. For more detailed information on histoplasmosis prevention and control, please contact the Acute Disease Control Division of the Indiana State Department of Health at (317) 233-7272.

2. The U.S. EPA and the Surgeon General recommend that people not have long-term exposure to radon at levels above 4 pCi/L. (For a county-by-county map of predicted radon levels in Indiana, visit: <http://www.in.gov/idem/4145.htm> (<http://www.in.gov/idem/4145.htm>).)

The U.S. EPA further recommends that all homes (and apartments within three stories of ground level) be tested for radon. If in-home radon levels are determined to be 4 pCi/L, or higher, EPA recommends a follow-up test. If the second test confirms that radon levels are 4 pCi/L, or higher, EPA recommends the installation of radon-reduction measures. (For a list of qualified radon testers and radon mitigation (or reduction) specialists visit: [http://www.in.gov/isdh/regsvcs/radhealth/pdfs/radon\\_testers\\_mitigators\\_list.pdf](http://www.in.gov/isdh/regsvcs/radhealth/pdfs/radon_testers_mitigators_list.pdf) ([http://www.in.gov/isdh/regsvcs/radhealth/pdfs/radon\\_testers\\_mitigators\\_list.pdf](http://www.in.gov/isdh/regsvcs/radhealth/pdfs/radon_testers_mitigators_list.pdf).) It also is recommended that radon reduction measures be built into all new homes, particularly in areas like Indiana that have moderate to high predicted radon levels.

To learn more about radon, radon risks, and ways to reduce exposure visit:

<http://www.in.gov/isdh/regsvcs/radhealth/radon.htm> (<http://www.in.gov/isdh/regsvcs/radhealth/radon.htm>), <http://www.in.gov/idem/4145.htm> (<http://www.in.gov/idem/4145.htm>), or <http://www.epa.gov/radon/index.html> (<http://www.epa.gov/radon/index.html>).

3. With respect to asbestos removal: all facilities slated for renovation or demolition (except residential buildings that have (4) four or fewer dwelling units and which will not be used for commercial purposes) must be inspected by an Indiana-licensed asbestos inspector prior to the commencement of any renovation or demolition activities. If regulated asbestos-containing material (RACM) that may become airborne is found, any subsequent demolition, renovation, or asbestos removal activities must be performed in accordance with the proper notification and emission control requirements.

If no asbestos is found where a renovation activity will occur, or if the renovation involves removal of less than 260 linear feet of RACM off of pipes, less than 160 square feet of RACM off of other facility components, or less than 35 cubic feet of RACM off of all facility components, the owner or operator of the project does not need to notify IDEM before beginning the renovation activity.

For questions on asbestos demolition and renovation activities, you can also call IDEM's Lead/Asbestos section at 1-888-574-8150.

However, in all cases where a demolition activity will occur (even if no asbestos is found), the owner or operator must still notify IDEM 10 working days prior to the demolition, using the form found at <http://www.in.gov/icpr/webfile/formsdiv/44593.pdf> (<http://www.in.gov/icpr/webfile/formsdiv/44593.pdf>).

Anyone submitting a renovation/demolition notification form will be billed a notification fee based upon the amount of friable asbestos containing material to be removed or demolished. Projects that involve the removal of more than 2,600 linear feet of friable asbestos containing materials on pipes, or 1,600 square feet or 400 cubic feet of friable asbestos containing material on other facility components, will be billed a fee of \$150 per project; projects below these amounts will be billed a fee of \$50 per project. All notification remitters will be billed on a quarterly basis.

For more information about IDEM policy regarding asbestos removal and disposal, visit: <http://www.in.gov/idem/4983.htm> (<http://www.in.gov/idem/4983.htm>).

4. With respect to lead-based paint removal: IDEM encourages all efforts to minimize human exposure to lead-based paint chips and dust. IDEM is particularly concerned that young children exposed to lead can suffer from learning disabilities. Although lead-based paint abatement efforts are not mandatory, any abatement that is conducted within housing built before January 1, 1978, or a child-occupied facility is required to comply with all lead-based paint work practice standards, licensing and notification requirements. For more information about lead-based paint removal visit: <http://www.in.gov/isdh/19131.htm> (<http://www.in.gov/isdh/19131.htm>).

5. Ensure that asphalt paving plants are permitted and operate properly. The use of cutback asphalt, or asphalt emulsion containing more than seven percent (7%) oil distillate, is prohibited during the months April through October. See 326 IAC 8-5-2 , Asphalt Paving Rule (<http://www.ai.org/legislative/iac/T03260/A00080.PDF> (<http://www.ai.org/legislative/iac/T03260/A00080.PDF>)).
6. If your project involves the construction of a new source of air emissions or the modification of an existing source of air emissions or air pollution control equipment, it will need to be reviewed by the IDEM Office of Air Quality (OAQ). A registration or permit may be required under 326 IAC 2 (View at: [www.ai.org/legislative/iac/t03260/a00020.pdf](http://www.ai.org/legislative/iac/t03260/a00020.pdf) (<http://www.ai.org/legislative/iac/t03260/a00020.pdf>)). New sources that use or emit hazardous air pollutants may be subject to Section 112 of the Clean Air Act and corresponding state air regulations governing hazardous air pollutants.
7. For more information on air permits visit: <http://www.in.gov/idem/4223.htm> (<http://www.in.gov/idem/4223.htm>), or to initiate the IDEM air permitting process, please contact the Office of Air Quality Permit Reviewer of the Day at (317) 233-0178 or OAMPROD atdem.state.in.us.

## LAND QUALITY

In order to maintain compliance with all applicable laws regarding contamination and/or proper waste disposal, IDEM recommends that:

1. If the site is found to contain any areas used to dispose of solid or hazardous waste, you need to contact the Office of Land Quality (OLQ) at 317-308-3103.
2. All solid wastes generated by the project, or removed from the project site, need to be taken to a properly permitted solid waste processing or disposal facility. For more information, visit <http://www.in.gov/idem/4998.htm> (<http://www.in.gov/idem/4998.htm>).
3. If any contaminated soils are discovered during this project, they may be subject to disposal as hazardous waste. Please contact the OLQ at 317-308-3103 to obtain information on proper disposal procedures.
4. If PCBs are found at this site, please contact the Industrial Waste Section of OLQ at 317-308-3103 for information regarding management of any PCB wastes from this site.
5. If there are any asbestos disposal issues related to this site, please contact the Industrial Waste Section of OLQ at 317-308-3103 for information regarding the management of asbestos wastes (Asbestos removal is addressed above, under Air Quality).
6. If the project involves the installation or removal of an underground storage tank, or involves contamination from an underground storage tank, you must contact the IDEM Underground Storage Tank program at 317/308-3039. See: <http://www.in.gov/idem/4999.htm> (<http://www.in.gov/idem/4999.htm>).

## FINAL REMARKS

Should you need to obtain any environmental permits in association with this proposed project, please be mindful that IC 13-15-8 requires that you notify all adjoining property owners and/or occupants within ten days your submittal of each permit application. However, if you are seeking multiple permits, you can still meet the notification requirement with a single notice if all required permit applications are submitted with the same ten day period.

Should the scope of the proposed project be expanded to the extent that a National Environmental Policy Act Environmental Assessment (EA) or Environmental Impact Statement (EIS) is required, IDEM will actively participate in any early interagency coordination review of the project.

Meanwhile, please note that this letter does not constitute a permit, license, endorsement or any other form of approval on the part of the Indiana Department of Environmental Management regarding any project for which a copy of this letter is used. Also note that it is the responsibility of the project engineer or consultant using this letter to ensure that the most current draft of this document, which is located at <http://www.in.gov/idem/5284.htm> (<http://www.in.gov/idem/5284.htm>), is used.

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## Signature(s) of the Applicant

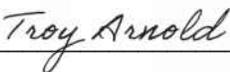
I acknowledge that the following proposed roadway project will be financed in part, or in whole, by public monies.

### Project Description

The Federal Highway Administration (FHWA) and Indiana Department of Transportation (INDOT) intend to proceed with an intersection improvements project at intersection of US 41 and Elkhorn Road, located approximately 1 mile south of Vincennes, Indiana. Proposed activities include construction of a Reduced Conflict Intersection (RCI) for northbound US 41 to the north of the intersection of US 41 and Elkhorn Road, and the removal of the existing northbound left turn lane at Elkhorn Road. Elkhorn Road west of US 41 will be modified to a right-in/right-out for US 41 southbound traffic. A northbound right turn lane from US 41 to Elkhorn Road will be added. Additional project activities include the construction of center curbs where Elkhorn Road intersects US 41, installation of new signage, and the installation of street lighting.

With my signature, I do hereby affirm that I have read the letter from the Indiana Department of Environment that appears directly above. In addition, I understand that in order to complete that project in which I am interested, with a minimum of impact to the environment, I must consider all the issues addressed in the aforementioned letter, and further, that I must obtain any required permits.

Date: 09/15/2020

Signature of the INDOT  
Project Engineer or Other Responsible Agent 

Troy Arnold

Date: 9/14/2020

Signature of the  
For Hire Consultant 

Sharon Anton

**THIS IS NOT A PERMIT**

**State of Indiana**  
**DEPARTMENT OF NATURAL RESOURCES**  
**Division of Fish and Wildlife**  
**Early Coordination/Environmental Assessment**

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**DNR #:** ER-22950

**Request Received:** August 6, 2020

**Requestor:** HNTB Corporation  
Susan Harrington  
111 Monument Circle, Suite 1200  
Indianapolis, IN 46204-5178

**Project:** US 41 and Elkhorn Road intersection improvement, south of Vincennes; Des #1800224

**County/Site info:** Knox

The Indiana Department of Natural Resources has reviewed the above referenced project per your request. Our agency offers the following comments for your information and in accordance with the National Environmental Policy Act of 1969.

If our agency has regulatory jurisdiction over the project, the recommendations contained in this letter may become requirements of any permit issued. If we do not have permitting authority, all recommendations are voluntary.

**Regulatory Assessment:** This proposal may require the formal approval of our agency pursuant to the Flood Control Act (IC 14-28-1) for any proposal to construct, excavate, or fill in or on the floodway of Mantle Ditch. Please submit more detailed plans to the Division of Water's Technical Services Section if you are unsure whether or not a permit will be required.

**Natural Heritage Database:** The Natural Heritage Program's data have been checked. The Banded Pygmy Sunfish (*Elassoma zonatum*), a state species of special concern, has been documented in Mantle Ditch within 1/2 mile of the project area.

**Fish & Wildlife Comments:** As long as standard erosion control measures are implemented near Mantle Ditch along the southernmost portion of the project area, we do not foresee any impacts to the Banded Pygmy Sunfish as a result of this project.

The measures below should be implemented to avoid, minimize, or compensate for impacts to fish, wildlife, and botanical resources:

1. Revegetate all bare and disturbed areas with a mixture of grasses (excluding all varieties of tall fescue) and legumes as soon as possible upon completion; low endophyte tall fescue may be used in the ditch bottom and side slopes only.
2. Do not excavate in the waterway and minimize disturbance to bank vegetation and contain disturbance to within the project limits.
3. Appropriately designed measures for controlling erosion and sediment must be implemented to prevent sediment from entering the stream or leaving the construction site; maintain these measures until construction is complete and all disturbed areas are stabilized.
4. Seed and protect all disturbed streambanks and slopes not protected by other methods that are 3:1 or steeper with erosion control blankets that are heavy-duty, biodegradable, and net free or that use loose-woven / Leno-woven netting to minimize the entrapment and snaring of small-bodied wildlife such as snakes and turtles (follow manufacturer's recommendations for selection and installation); seed and apply mulch on all other disturbed areas.

**THIS IS NOT A PERMIT**

**State of Indiana**  
**DEPARTMENT OF NATURAL RESOURCES**  
**Division of Fish and Wildlife**  
**Early Coordination/Environmental Assessment**

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**Contact Staff:**

Christie L. Stanifer, Environ. Coordinator, Fish & Wildlife  
Our agency appreciates this opportunity to be of service. Please contact the above staff member at (317) 232-4080 if we can be of further assistance.

*Christie L. Stanifer*

**Date:** September 4, 2020

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Christie L. Stanifer  
Environ. Coordinator  
Division of Fish and Wildlife

## Sharon Anton

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**From:** Hunter Pinnell <hunter@vintilities.com>  
**Sent:** Friday, August 7, 2020 7:53 AM  
**To:** Sharon Anton  
**Cc:** 'Jake Personett'; 'Dick Vermillion'; 'Stan Eck'  
**Subject:** RE: Early Coordination Letter - US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224)

Sharon,

This project is outside of Vincennes City Limits and does not drain into it either so it is outside of our MS4 jurisdiction. I have copied the Knox County Surveyor, Dick Vermillion, on this in case he has any interest in it. Let us know if any questions.

Thanks,

Hunter Pinnell  
Stormwater Coordinator  
Levee Manager  
Vincennes Water Utilities  
[\(812\) 882-5326](tel:8128825326) Direct  
[\(812\) 887-0681](tel:8128870681) Cell  
[\(812\) 882-7877](tel:8128827877) Main Office  
[hunter@vintilities.com](mailto:hunter@vintilities.com)  
[www.vintilities.com](http://www.vintilities.com)

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**From:** Sharon Anton <santon@HNTB.com>  
**Sent:** Thursday, August 6, 2020 4:03 PM  
**To:** hunter@vintilities.com  
**Subject:** Early Coordination Letter - US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224)

Dear Mr. Pinnell,

Please see the attached early coordination letter and supporting graphics for the US 41 at Elkhorn Road Intersection Improvement Project (Des 1800224).

If you have any questions regarding this project, please feel free to contact me by phone or email.

Best regards,

**Sharon Anton**  
Scientist I  
Environmental Planning  
Tel (317) 917-5275 Email [santon@hntb.com](mailto:santon@hntb.com)

**HNTB CORPORATION**  
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## Sharon Anton

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**From:** Falls, Ryan G <RFalls@indot.IN.gov>  
**Sent:** Tuesday, April 14, 2020 12:40 PM  
**To:** Sharon Anton  
**Cc:** Susan Harrington  
**Subject:** RE: USFWS Bat Layer Check - Des. Nos. 1800224 - negative

A review of the USFWS database did not indicate the presence of endangered bat species in or within 0.5 mile of the project area. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects".

### Ryan Falls

#### *Capital Program Management-Senior Environmental Manager Supervisor*

Indiana Department of Transportation

3650 South US Highway 41

Vincennes, IN 47591

**Office:** 812-895-7326

**Cell:** 812-582-1387

**Email:** [rfalls@indot.IN.gov](mailto:rfalls@indot.IN.gov)



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**From:** Sharon Anton <santon@HNTB.com>  
**Sent:** Tuesday, April 14, 2020 11:23 AM  
**To:** Falls, Ryan G <RFalls@indot.IN.gov>  
**Cc:** Susan Harrington <sharrington@HNTB.com>  
**Subject:** USFWS Bat Layer Check - Des. Nos. 1800224 & 1800226

**\*\*\*\* This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. \*\*\*\***

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Good morning, Ryan,

HNTB would like to request a query of the USFWS Bat Database for inclusion in the environmental documentation for Des. No. 1800224, US 41 and Elkhorn Road J-Turn & Bridge Widening Project and for Des. No. 1800226, US 41 and SR 58 J-Turn Project.

The US 41 and Elkhorn Road J-Turn & Bridge Widening Project consists of the creation of a J-Turn intersection and associated roadway maintenance, as well as associated bridge widening for the bridge carrying US 41 over Mandle Ditch in Vincennes Twp., Knox County.

The US 41 and SR 58 J-Turn Project consists of the creation of a J-Turn intersection and associated roadway maintenance at US 41 and SR 58 in Haddon Twp., Sullivan County.

Please see attached graphics for specific location information, and please let me know if you need any additional information.

July 17, 2020

Hunter Pinnell  
City of Vincennes  
403 Busseron St.  
Vincennes, IN 47591

Subject: Initial Notice of Proposed Improvement Project Des. No. 1800224

Dear Mr. Pinnell,

Our firm has been assigned the task of utility coordination for the project referenced above by the Indiana Department of Transportation. In accordance with 105 IAC 13-3-1(c), this letter serves as your initial notice of the proposed improvement project Des. No. 1800224 on U.S 41 in Knox County, Indiana.

In accordance with 105 IAC 13-3-1(c), the following information is provided. The dates listed in items (4) and (5) below are the currently scheduled dates.

- |                                               |                                                                                                                                                                                                |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Name or route number:                     | 41                                                                                                                                                                                             |
| (2) Geographical limits:                      | At Elkhorn Road, located approximately 1.00 miles south of the U.S 41/BUS 41 interchange in Section 17, T-2-N, R-10-W, Vincennes Township, Knox County, Indiana; From RP 051+005 to RP 051+035 |
| (3) General description of work:              | Intersection Improvements and Roadway Modifications                                                                                                                                            |
| (4) Date approved work plan will be needed:   | 10/06/2022                                                                                                                                                                                     |
| (5) Ready for contracts date:                 | 01/04/2023                                                                                                                                                                                     |
| (6) Name of designer and contact information: | Josh Cook, P.E., <a href="mailto:jlcook@HNTB.com">jlcook@HNTB.com</a> , HNTB Corporation, 111 Monument Circle, Suite 1200, Indianapolis, IN 46204                                              |
| (7) Major or minor project:                   | Minor                                                                                                                                                                                          |

In accordance with 105 IAC 13-3-1(d), within 30 days after receiving the initial notice, the utility shall respond in writing with a:

- (1) Description of the type and location of its facilities within the geographical limits of the proposed improvement project; or
- (2) If the utility has determined to the best of their abilities that they do not have facilities within the geographical limits of the improvement project; complete, sign, and return Page 1 of the attached Work Plan.

Additionally, please provide us the name, telephone number, postal address and email address of the person selected as your designated contact for this project to expedite future communications. We will contact Indiana 811 and request locates for this project prior to our survey. If you would prefer to provide us location information by some other means please contact this office to discuss.

Please send your response to Jason McCort, P.S., HNTB Corporation, 111 Monument Circle, Suite 1200, Indianapolis, IN 46204, telephone: 317-636-4682, [jmccort@hntb.com](mailto:jmccort@hntb.com). Thank you for your attention to these matters.

Sincerely,

Jason McCort, PS  
Utility Coordinator

Cc: Tabitha Enyart, PE HNTB Corporation  
Katerina Sparks, INDOT



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Indiana Ecological Services Field Office

620 South Walker Street

Bloomington, IN 47403-2121

Phone: (812) 334-4261 Fax: (812) 334-4273

<http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html>

In Reply Refer To:

September 01, 2020

Consultation Code: 03E12000-2020-SLI-2527

Event Code: 03E12000-2020-E-10090

Project Name: US 41 at Elkhorn Road Intersection Improvement Project (Des. No. 1800224)

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project "may affect" listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website <http://ecos.fws.gov/ipac/> at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - <http://www.fws.gov/midwest/endangered/section7/s7process/index.html>. This website contains step-by-step instructions which will help you

determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all **wind energy projects** and **projects that include installing towers that use guy wires or are over 200 feet in height**, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at <http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html> to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Indiana Ecological Services Field Office**

620 South Walker Street

Bloomington, IN 47403-2121

(812) 334-4261

## Project Summary

Consultation Code: 03E12000-2020-SLI-2527

Event Code: 03E12000-2020-E-10090

Project Name: US 41 at Elkhorn Road Intersection Improvement Project (Des. No. 1800224)

Project Type: TRANSPORTATION

Project Description: The Indiana Department of Transportation (INDOT) and the Federal Highway Administration (FHWA) intend to proceed with a project involving improvements to the intersection of US 41 and Elkhorn Road in Knox County. More specifically, the project is located in Common Lots C, in Vincennes Township, Indiana.

Project activities shall include construction of a Reduced Conflict Intersection (RCI) for northbound US 41 to the north of the intersection of US 41 and Elkhorn Road, and the removal of the existing northbound left turn lane at Elkhorn Road. Elkhorn Road west of US 41 will be modified to a right-in/right-out for US 41 southbound traffic. A northbound right turn lane from US 41 to Elkhorn Road will be added. Additional project activities include the construction of center curbs where Elkhorn Road intersects US 41, installation of new signage, and the installation of street lighting.

Trees suitable for roosting by both the Indiana bat and the Northern long-eared bat exist along the US 41 roadside near the project area. No tree clearing is anticipated. The project does involve permanent lighting alterations. Temporary lighting may also be necessary. A query of the USFWS Bat Database by INDOT Vincennes District staff conducted on April 14, 2020 did not identify any documented sites within 0.5 mile of the project area. Work is anticipated to take place from approximately spring-fall of 2023.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.63425503902056N87.53135952636569W>



Counties: Knox, IN

## Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Mammals

| NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | STATUS     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Indiana Bat <i>Myotis sodalis</i><br>There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/5949">https://ecos.fws.gov/ecp/species/5949</a><br>Species survey guidelines:<br><a href="https://ecos.fws.gov/ipac/guideline/survey/population/1/office/31440.pdf">https://ecos.fws.gov/ipac/guideline/survey/population/1/office/31440.pdf</a>                                                                                                                                                                                                                                        | Endangered |
| Northern Long-eared Bat <i>Myotis septentrionalis</i><br>No critical habitat has been designated for this species.<br>This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> <li>▪ Incidental take of the NLEB is not prohibited here. Federal agencies may consult using the 4(d) rule streamlined process. Transportation projects may consult using the programmatic process. See <a href="http://www.fws.gov/midwest/endangered/mammals/nleb/index.html">www.fws.gov/midwest/endangered/mammals/nleb/index.html</a></li> </ul> Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a> | Threatened |

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Indiana Ecological Services Field Office

620 South Walker Street

Bloomington, IN 47403-2121

Phone: (812) 334-4261 Fax: (812) 334-4273

<http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html>

In Reply Refer To:

September 03, 2020

Consultation Code: 03E12000-2020-I-2527

Event Code: 03E12000-2020-E-10196

Project Name: US 41 at Elkhorn Road Intersection Improvement Project (Des. No. 1800224)

Subject: Concurrence verification letter for the 'US 41 at Elkhorn Road Intersection Improvement Project (Des. No. 1800224)' project under the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request to verify that the **US 41 at Elkhorn Road Intersection Improvement Project (Des. No. 1800224)** (Proposed Action) may rely on the concurrence provided in the February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action is within the scope and adheres to the criteria of the PBO, including the adoption of applicable avoidance and minimization measures, and may affect, but is not likely to adversely affect (NLAA) the endangered Indiana bat (*Myotis sodalis*) and/or the threatened Northern long-eared bat (*Myotis septentrionalis*).

The Service has 14 calendar days to notify the lead Federal action agency or designated non-federal representative if we determine that the Proposed Action does not meet the criteria for a NLAA determination under the PBO. If we do not notify the lead Federal action agency or designated non-federal representative within that timeframe, you may proceed with the Proposed Action under the terms of the NLAA concurrence provided in the PBO. This verification period allows Service Field Offices to apply local knowledge to implementation of the PBO, as we may identify a small subset of actions having impacts that were unanticipated. In such instances, Service Field Offices may request additional information that is necessary to verify inclusion of the proposed action under the PBO.

**For Proposed Actions that include bridge/structure removal, replacement, and/or maintenance activities:** If your initial bridge/structure assessments failed to detect Indiana bats, but you later detect bats during construction, please submit the Post Assessment Discovery of Bats at Bridge/Structure Form (User Guide Appendix E) to this Service Office. In these instances, potential incidental take of Indiana bats may be exempted provided that the take is reported to the Service.

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or Northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required. If the Proposed Action may affect any other federally-listed or proposed species, and/or any designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please contact this Service Office.

## Project Description

The following project name and description was collected in IPaC as part of the endangered species review process.

### Name

US 41 at Elkhorn Road Intersection Improvement Project (Des. No. 1800224)

### Description

The Indiana Department of Transportation (INDOT) and the Federal Highway Administration (FHWA) intend to proceed with a project involving improvements to the intersection of US 41 and Elkhorn Road in Knox County. More specifically, the project is located in Common Lots C, in Vincennes Township, Indiana.

Project activities shall include construction of a Reduced Conflict Intersection (RCI) for northbound US 41 to the north of the intersection of US 41 and Elkhorn Road, and the removal of the existing northbound left turn lane at Elkhorn Road. Elkhorn Road west of US 41 will be modified to a right-in/right-out for US 41 southbound traffic. A northbound right turn lane from US 41 to Elkhorn Road will be added. Additional project activities include the construction of center curbs where Elkhorn Road intersects US 41, installation of new signage, and the installation of street lighting.

Trees suitable for roosting by both the Indiana bat and the Northern long-eared bat exist along the US 41 roadside near the project area. No tree clearing is anticipated. The project does involve permanent lighting alterations. Temporary lighting may also be necessary. A query of the USFWS Bat Database by INDOT Vincennes District staff conducted on April 14, 2020 did not identify any documented sites within 0.5 mile of the project area. Work is anticipated to take place from approximately spring-fall of 2023.

## Determination Key Result

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the endangered Indiana bat and/or the threatened Northern long-eared bat, therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

## Qualification Interview

1. Is the project within the range of the Indiana bat<sup>[1]</sup>?

[1] See [Indiana bat species profile](#)

**Automatically answered**

Yes

2. Is the project within the range of the Northern long-eared bat<sup>[1]</sup>?

[1] See [Northern long-eared bat species profile](#)

**Automatically answered**

Yes

3. Which Federal Agency is the lead for the action?

*A) Federal Highway Administration (FHWA)*

4. Are *all* project activities limited to non-construction<sup>[1]</sup> activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

[1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

*No*

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/rail surfaces<sup>[1]</sup>?

[1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

*No*

6. Does the project include *any* activities **within** 0.5 miles of a known Indiana bat and/or NLEB hibernaculum<sup>[1]</sup>?

[1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

*No*

7. Is the project located **within** a karst area?

*No*

8. Is there *any* suitable<sup>[1]</sup> summer habitat for Indiana Bat or NLEB **within** the project action area<sup>[2]</sup>? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

[2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the [national consultation FAQs](#).

*Yes*

9. Will the project remove *any* suitable summer habitat<sup>[1]</sup> and/or remove/trim any existing trees **within** suitable summer habitat?

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

*No*

10. Does the project include activities **within documented Indiana bat habitat**<sup>[1][2]</sup>?

[1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

[2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

*No*

11. Does the project include activities **within documented NLEB habitat**<sup>[1][2]</sup>?

[1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

[2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

*No*

12. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

*No*

13. Does the project include slash pile burning?

*No*

14. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

*No*

15. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)

*No*

16. Will the project involve the use of **temporary** lighting *during* the active season?

*Yes*

17. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **temporary** lighting will be used?

*Yes*

18. Will the project install new or replace existing **permanent** lighting?

*Yes*

19. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **permanent** lighting will be installed or replaced?

*Yes*

20. Does the project include percussives or other activities (**not including tree removal/trimming or bridge/structure work**) that will increase noise levels above existing traffic/background levels?

*Yes*

21. Will the activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season<sup>[1]</sup>?

[1] Coordinate with the local Service Field Office for appropriate dates.

*Yes*

22. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season<sup>[1]</sup>?

[1] Coordinate with the local Service Field Office for appropriate dates.

*Yes*

23. Are *all* project activities that are **not associated with** habitat removal, tree removal/trimming, bridge and/or structure activities, temporary or permanent lighting, or use of percussives, limited to actions that DO NOT cause any additional stressors to the bat species?

Examples: lining roadways, unlighted signage, rail road crossing signals, signal lighting, and minor road repair such as asphalt fill of potholes, etc.

*Yes*

24. Will the project raise the road profile **above the tree canopy**?

*No*

25. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) consistent with a Not Likely to Adversely Affect determination in this key?

**Automatically answered**

*Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the active season within undocumented habitat.*

26. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) and/or increase noise levels above existing traffic/background levels consistent with a No Effect determination in this key?

**Automatically answered**

*Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the inactive season*

27. **General AMM 1**

Will the project ensure *all* operators, employees, and contractors working in areas of known or presumed bat habitat are aware of *all* FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures?

Yes

28. **Lighting AMM 1**

Will *all* **temporary** lighting be directed away from suitable habitat during the active season?

Yes

29. **Lighting AMM 2**

Does the lead agency use the BUG (Backlight, Uplight, and Glare) system developed by the Illuminating Engineering Society<sup>[1][2]</sup> to rate the amount of light emitted in unwanted directions?

[1] Refer to [Fundamentals of Lighting - BUG Ratings](#)

[2] Refer to [The BUG System—A New Way To Control Stray Light](#)

Yes

30. **Lighting AMM 2**

Will the **permanent** lighting be designed to be as close to 0 for all three BUG ratings as possible, with a priority of "uplight" of 0 and "backlight" as low as practicable?

Yes

## Project Questionnaire

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

N/A

2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

N/A

## **Avoidance And Minimization Measures (AMMs)**

This determination key result includes the commitment to implement the following Avoidance and Minimization Measures (AMMs):

### **GENERAL AMM 1**

Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs.

### **LIGHTING AMM 1**

Direct temporary lighting away from suitable habitat during the active season.

### **LIGHTING AMM 2**

When installing new or replacing existing permanent lights, use downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting); or for those transportation agencies using the BUG system developed by the Illuminating Engineering Society, be as close to 0 for all three ratings with a priority of "uplight" of 0 and "backlight" as low as practicable.

## **Determination Key Description: FHWA, FRA, FTA Programmatic Consultation For Transportation Projects Affecting NLEB Or Indiana Bat**

This key was last updated in IPaC on December 02, 2019. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the threatened **Northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's [February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects](#). The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

## APPENDIX D: SECTION 106 OF NHPA

**Category A consists of projects that, by their nature, have no effect on properties listed in or eligible for inclusion in the National Register of Historic Places (hereinafter referred to as the “National Register”) and do not require review by INDOT Cultural Resources Office. All of the work under this Category must occur in previously disturbed soils, which are defined as soils that have been completely altered or displaced by earthmoving or other modern manipulation.**

1. Any work on bridges limited to substructure or superstructure elements without replacing, widening, or elevating the superstructure under the conditions listed below (***BOTH Conditions A and B must be met***). This category **does not** include bridge replacement projects (when both superstructure and substructure are removed):
  - A. The project takes place in previously disturbed soils; *AND*
  - B. With regard to the bridges, at least one of the conditions (i, ii or iii) listed below must be satisfied:
    - i. The latest Historic Bridge Inventory identified the bridge as non-historic (see <http://www.in.gov/indot/2531.htm>);
    - ii. The bridge was built after 1945, and is a common type as defined in Section V. of the *Program Comment Issued for Streamlining Section 106 Review for Actions Affecting Post-1945 Concrete and Steel Bridges* issued by the Advisory Council on Historic Preservation on November 2, 2012 for so long as that Program Comment remains in effect AND the considerations listed in Section IV of the Program Comment do not apply;
    - iii. The bridge is part of the Interstate system and was determined not eligible for the National Register under the Section 106 Exemption Regarding Effects to the Interstate Highway System adopted by the Advisory Council on Historic Preservation on March 10, 2005, for so long as that Exemption remains in effect.
2. All work within interchanges and within medians of divided highways in previously disturbed soils.
3. Replacement, repair, lining, or extension of culverts and other drainage structures that do not exhibit wood, stone or brick structures or parts therein and are in previously disturbed soils.
4. Roadway work associated with surface replacement, reconstruction, rehabilitation, or resurfacing projects, including overlays, shoulder treatments, pavement repair, seal coating, pavement grinding, and pavement marking within previously disturbed soils where replacement, repair, or installation of curbs, curb ramps or sidewalks will not be required.
5. Repair, in-kind replacement or upgrade of existing lighting, signals, signage, and other traffic control devices in previously disturbed soils.
6. Repair, replacement, or upgrade of existing safety appurtenances such as guardrails, barriers, glare screens, and crash attenuators in previously disturbed soils.
7. Repair or in-kind replacement of fencing and hardscape landscaping elements and/or replacement of existing plant materials in previously disturbed soils and installation of new fencing and hardscape landscaping elements and plant materials limited to locations within interstate right-of way within previously disturbed soils.
8. Installation of new or modification of existing traffic control devices and systems, including signs, signals, markings, illumination, other warning devices and their supports, to improve safety at railway crossings in previously disturbed soils.
9. Installation, repair, or replacement of erosion control measures along roadways, waterways and bridge piers within previously disturbed soils.

## APPENDIX E: RED FLAG AND HAZARDOUS MATERIALS



# INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue  
Room N642  
Indianapolis, Indiana 46204

PHONE: (317) 232-5113  
FAX: (317) 233-4929

**Eric Holcomb, Governor**  
**Joe McGuinness,**  
**Commissioner**

Date: July 10, 2020

To: Site Assessment & Management  
Environmental Policy Office - Environmental Services Division  
Indiana Department of Transportation  
100 N Senate Avenue, Room N642  
Indianapolis, IN 46204

From: Sharon Anton  
HNTB Corporation  
111 Monument Circle  
Indianapolis, IN 46204  
santon@hntb.com

Re: RED FLAG INVESTIGATION  
DES 1800224, State Project  
Intersection Improvement  
US 41 at Elkhorn Road  
Vincennes, Knox County, Indiana

## PROJECT DESCRIPTION

Brief Description of Project: The project consists of improvements to the intersection of US 41 at Elkhorn Road in Knox County, Indiana. Proposed activities include construction of a median U-turn at the intersection of US 41 and Elkhorn, installation of new signage, and installation of street lighting. Additionally, the bridges carrying US 41 northbound and southbound over Mantle Ditch will be widened to accommodate the intersection design. The northbound bridge will be widened to the inside and to the outside, while the southbound bridge will be widened to the inside only.

Bridge and/or Culvert Project: Yes  No  Structure # 041-42-05077 ANBL & 041-42-05077 ASBL

If this is a bridge project, is the bridge Historical? Yes  No  , Select  Non-Select

(Note: If the project involves a historical bridge, please include the bridge information in the Recommendations Section of the report).

Proposed right of way: Temporary  # Acres \_\_\_\_\_ Permanent  # Acres \_\_\_\_\_, Not Applicable

Type of excavation: Excavation to a depth of up to five feet will occur for construction of new turn lanes and up to eight feet for installation of new lighting. Ground mounted signs are planned, but excavation to a depth of twelve feet may be necessary if panel signs are used.

Maintenance of traffic: Traffic will be maintained in two stages with median left turn lanes and U-turns constructed first with existing intersection open to traffic; the second stage will close the intersection while U-turns are utilized.

Work in waterway: Yes  No  Below ordinary high water mark: Yes  No

State Project:  LPA:

Any other factors influencing recommendations: N/A

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## **INFRASTRUCTURE TABLE AND SUMMARY**

| <b>Infrastructure</b>                                                                                                        |            |                         |            |
|------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------|------------|
| Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A: |            |                         |            |
| Religious Facilities                                                                                                         | <b>N/A</b> | Recreational Facilities | <b>N/A</b> |
| Airports <sup>1</sup>                                                                                                        | <b>N/A</b> | Pipelines               | <b>N/A</b> |
| Cemeteries                                                                                                                   | <b>N/A</b> | Railroads               | <b>N/A</b> |
| Hospitals                                                                                                                    | <b>N/A</b> | Trails                  | <b>N/A</b> |
| Schools                                                                                                                      | <b>N/A</b> | Managed Lands           | <b>N/A</b> |

<sup>1</sup>In order to complete the required airport review, a review of public airports within 3.8 miles (20,000 feet) is required.

Explanation: No infrastructure resources were identified within the 0.5 mile search radius.

## **WATER RESOURCES TABLE AND SUMMARY**

| <b>Water Resources</b>                                                                                                       |            |                         |            |
|------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------|------------|
| Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A: |            |                         |            |
| NWI - Points                                                                                                                 | <b>N/A</b> | Canal Routes - Historic | <b>N/A</b> |
| Karst Springs                                                                                                                | <b>N/A</b> | NWI - Wetlands          | <b>13</b>  |
| Canal Structures – Historic                                                                                                  | <b>N/A</b> | Lakes                   | <b>8</b>   |
| NPS NRI Listed                                                                                                               | <b>N/A</b> | Floodplain - DFIRM      | <b>1</b>   |
| NWI-Lines                                                                                                                    | <b>3</b>   | Cave Entrance Density   | <b>N/A</b> |
| IDEM 303d Listed Streams and Lakes (Impaired)                                                                                | <b>N/A</b> | Sinkhole Areas          | <b>N/A</b> |
| Rivers and Streams                                                                                                           | <b>2</b>   | Sinking-Stream Basins   | <b>N/A</b> |

Explanation:

**NWI-Wetlands:** Thirteen (13) wetlands are located within the 0.5 mile search radius. The nearest wetland is located 0.04 mile northeast of the project area. No impact is expected.

**Lakes:** Eight (8) lakes are located within the 0.5 mile search radius. The nearest lake is located 0.04 mile northeast of the project area. No impact is expected.

**Floodplains:** One (1) floodplain polygon is located within the 0.5 mile search radius. The floodplain polygon is located approximately 0.14 mile southwest of the project area at its nearest point. No impact is expected.

**NWI-Lines:** Three (3) NWI-Lines are located within the 0.5 mile search radius. One (1) NWI-Line segment is located within the project area. A Waters of the US Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

**Rivers and Streams:** Two (2) rivers and streams segment are located within the 0.5 mile search radius. One (1) rivers and streams segment, associated with Mantle Ditch, is located within the project area. A Waters of the US Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

**URBANIZED AREA BOUNDARY SUMMARY**

Explanation: Though the project area is mapped within the Vincennes UAB, the MS4 permitted portion of the UAB is over 0.5 mile away from the project area. No impact is expected.

**MINING AND MINERAL EXPLORATION TABLE AND SUMMARY**

|                                                                                                                              |            |                     |            |
|------------------------------------------------------------------------------------------------------------------------------|------------|---------------------|------------|
| <b>Mining/Mineral Exploration</b>                                                                                            |            |                     |            |
| Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A: |            |                     |            |
| Petroleum Wells                                                                                                              | <b>2</b>   | Mineral Resources   | <b>N/A</b> |
| Mines – Surface                                                                                                              | <b>N/A</b> | Mines – Underground | <b>N/A</b> |

Explanation:

Petroleum Wells: Two (2) petroleum wells are located within the 0.5 mile search radius. The nearest petroleum well is located approximately 0.38 mile southwest of the project area. No impact is expected.

**HAZARDOUS MATERIAL CONCERNS TABLE AND SUMMARY**

|                                                                                                                              |            |                                   |            |
|------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------|------------|
| <b>Hazardous Material Concerns</b>                                                                                           |            |                                   |            |
| Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A: |            |                                   |            |
| Superfund                                                                                                                    | <b>N/A</b> | Manufactured Gas Plant Sites      | <b>N/A</b> |
| RCRA Generator/ TSD                                                                                                          | <b>2</b>   | Open Dump Waste Sites             | <b>N/A</b> |
| RCRA Corrective Action Sites                                                                                                 | <b>N/A</b> | Restricted Waste Sites            | <b>N/A</b> |
| State Cleanup Sites                                                                                                          | <b>N/A</b> | Waste Transfer Stations           | <b>N/A</b> |
| Septage Waste Sites                                                                                                          | <b>N/A</b> | Tire Waste Sites                  | <b>N/A</b> |
| Underground Storage Tank (UST) Sites                                                                                         | <b>1</b>   | Confined Feeding Operations (CFO) | <b>N/A</b> |
| Voluntary Remediation Program                                                                                                | <b>N/A</b> | Brownfields                       | <b>N/A</b> |
| Construction Demolition Waste                                                                                                | <b>N/A</b> | Institutional Controls            | <b>N/A</b> |
| Solid Waste Landfill                                                                                                         | <b>N/A</b> | NPDES Facilities                  | <b>5</b>   |
| Infectious/Medical Waste Sites                                                                                               | <b>N/A</b> | NPDES Pipe Locations              | <b>N/A</b> |
| Leaking Underground Storage (LUST) Sites                                                                                     | <b>N/A</b> | Notice of Contamination Sites     | <b>N/A</b> |

Explanation:

RCRA Generator/TSD Sites: Two (2) RCRA Generator sites are located within the 0.5 mile search radius. The nearest facility, Best Way Express Incorporated, 2820 S. Old Decker Road, Agency ID 38323, is mapped 0.43 mile northeast of the project area. This facility is incorrectly mapped and is located 0.52 mile northeast of the project area. No impact is expected. The next nearest facility, Lewis Bakeries, 2792 S. Old Decker Road, Agency ID 14252, is mapped 0.44 mile northeast of the project area. This facility is incorrectly mapped and is located 0.68 mile east of the project area. No impact is expected.

Underground Storage Tank (UST) Sites: One (1) UST site is mapped within the 0.5 mile search radius. Best Way Express Incorporated/Commercial Rentals, Inc., 2820 S. Old Decker Road, Agency ID 38323, is mapped 0.43 mile northeast of the project area. This facility is incorrectly mapped and is located 0.52 mile northeast of the project area. No impact is expected.

NPDES Facilities: Five (5) NPDES Facilities are located within the 0.5 mile search radius. One (1) facility, Toth Enterprises of Indiana Expansion, Agency ID 117443, Permit # INR10M759, is located adjacent to the west of the project area. The permit for the facility is in effect. Coordination with the facility will occur.

### **ECOLOGICAL INFORMATION SUMMARY**

The Knox County listing of the Indiana Natural Heritage Data Center information on endangered, threatened, or rare (ETR) species and high quality natural communities is attached with ETR species highlighted. A preliminary review of the Indiana Natural Heritage Database by INDOT Environmental Services did indicate the presence of ETR species within the 0.5 mile search radius. Coordination with USFWS and IDNR will occur.

A review of the USFWS database did not indicate the presence of endangered bat species in or within 0.5 mile of the project area. The project area is located in a rural area with several commercial and industrial facilities nearby. The August 21, 2018, inspection reports for Bridge # 041-42-05077 ANBL & Bridge # 041-42-05077 ASBL state that no evidence of bats was seen or heard under the bridges. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects".

### **RECOMMENDATIONS SECTION**

Include recommendations from each section. If there are no recommendations, please indicate N/A:

INFRASTRUCTURE: N/A

WATER RESOURCES:

The presence of the following water resources will require the preparation of a Waters of the US Report and coordination with INDOT ES Ecology and Waterway Permitting:

- One (1) stream segment, Mantle Ditch, flows through the project area.
- One (1) NWI line segment is located within the project area.

URBANIZED AREA BOUNDARY: N/A

MINING/MINERAL EXPLORATION: N/A

HAZMAT CONCERNS:

Toth Enterprises of Indiana Expansion, Agency ID 117443, Permit # INR10M759, is located adjacent to the west of the project area. The permit for the facility is in effect. Coordination with the facility will occur.

ECOLOGICAL INFORMATION:

Coordination with the USFWS and IDNR will occur. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects".

INDOT Environmental Services concurrence:

**Aaron Aldred**

Digitally signed by Aaron Aldred  
Date: 2020.07.13 11:20:05 -04'00'

(Signature)

[www.in.gov/dot/](http://www.in.gov/dot/)  
**An Equal Opportunity Employer**

Prepared by:  
Sharon Anton  
Scientist I  
HNTB

**Graphics:**

A map for each report section with a 0.5 mile search radius buffer around all project area(s) showing all items identified as possible items of concern is attached. If there is not a section map included, please change the YES to N/A:

SITE LOCATION: YES

INFRASTRUCTURE: N/A

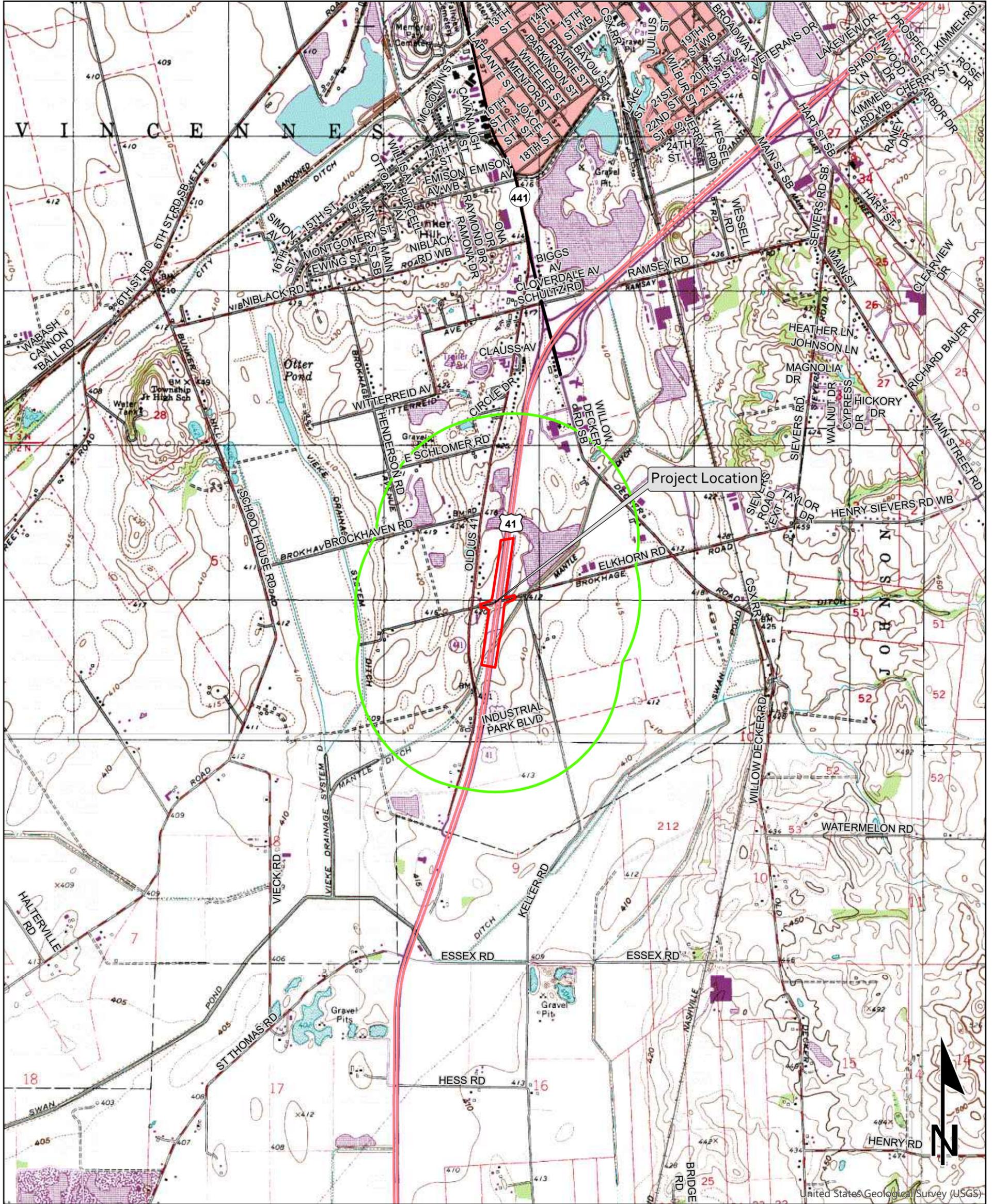
WATER RESOURCES: YES

URBANIZED AREA BOUNDARY: YES

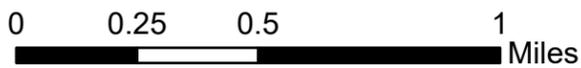
MINING/MINERAL EXPLORATION: YES

HAZARDOUS MATERIAL CONCERNS: YES

**Red Flag Investigation - Site Location**  
**US 41 at Elkhorn Road**  
**Des. No 1800224, Intersection Improvement**  
**Knox County, Indiana**



**Sources:**  
**Non Orthophotography Data** - Obtained from the State of Indiana Geographical Information Office Library  
**Orthophotography** - Obtained from Indiana Map Framework Data ([www.indianamap.org](http://www.indianamap.org))  
**Map Projection:** State Plane Indiana West (FIPS 1301 Ft US)  
**Map Datum:** NAD83



This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

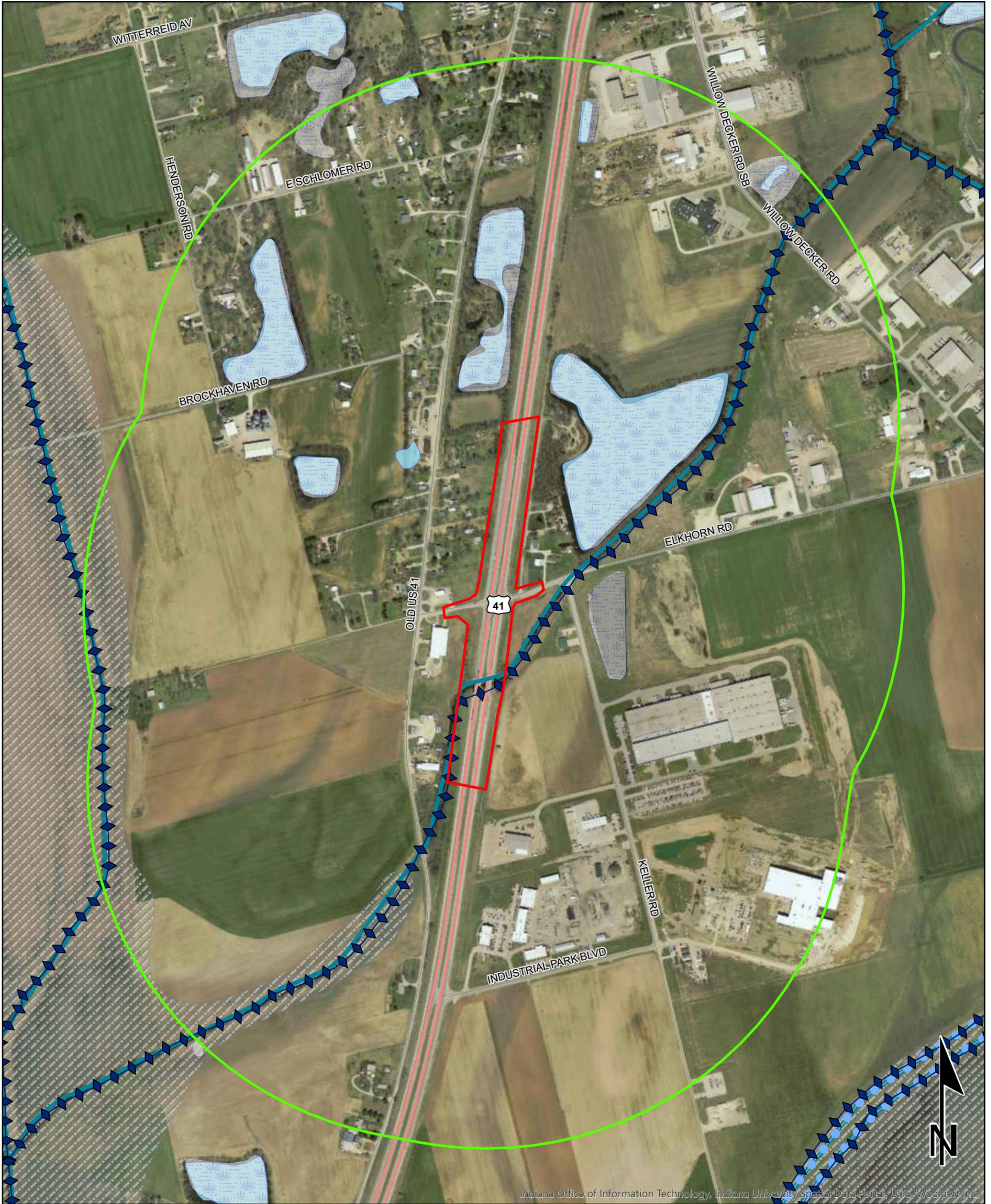
**DECKER, FRICTHTON, AND IONA**  
**QUADRANGLES INDIANA**  
**7.5 MINUTE SERIES AND**  
**VINCNEES QUADRANGLE ILLINOIS**  
**7.5 MINUTE SERIES**

# Red Flag Investigation- Water Resources

## US 41 at Elkhorn Road

### Des. No 1800224, Intersection Improvement

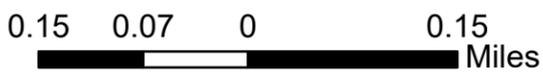
### Knox County, Indiana



Indiana Office of Information Technology, Indiana University Spatial Data Portal, UITS, Woolpert Inc.

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|                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                          |                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li> NWI - Point</li> <li> Karst Spring</li> <li> NWI - Line</li> <li> Impaired_Stream_Lake</li> <li> NPS NRI listed</li> <li> River</li> <li> Canal Structure - Historic</li> <li> Canal Route - Historic</li> </ul> | <ul style="list-style-type: none"> <li> Wetlands</li> <li> Lake</li> <li> Floodplain - DFIRM</li> <li> Cave Entrance Density</li> <li> Sinkhole Area</li> <li> Sinking-Stream Basin</li> <li> County Boundary</li> </ul> | <ul style="list-style-type: none"> <li> Project Area</li> <li> Half Mile Radius</li> <li> Toll</li> <li> Interstate</li> <li> State Route</li> <li> US Route</li> <li> Local Road</li> </ul> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

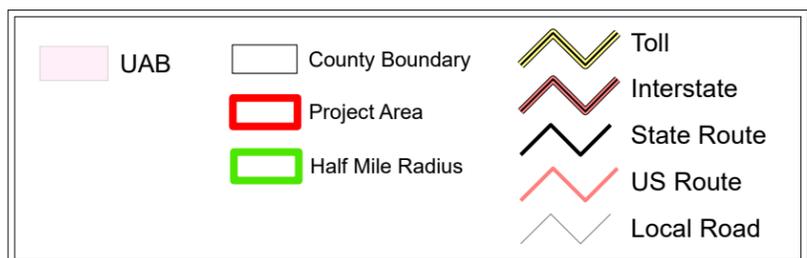
Red Flag Investigation - Urbanized Area Boundary  
 US 41 at Elkhorn Road  
 Des. No 1800224, Intersection Improvement  
 Knox County, Indiana



Indiana Office of Information Technology, Indiana University Spatial Data Portal, UITS, Woolpert Inc., Indiana Office of Information Technology, Indiana University Spatial Data Portal, UITS, Woolpert Inc.

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Red Flag Investigation - Mining/Mineral Exploration  
 US 41 at Elkhorn Road  
 Des. No 1800224, Intersection Improvement  
 Knox County, Indiana



Indiana Office of Information Technology, Indiana University Spatial Data Portal, UITS, Woolpert Inc.,

**Sources:**

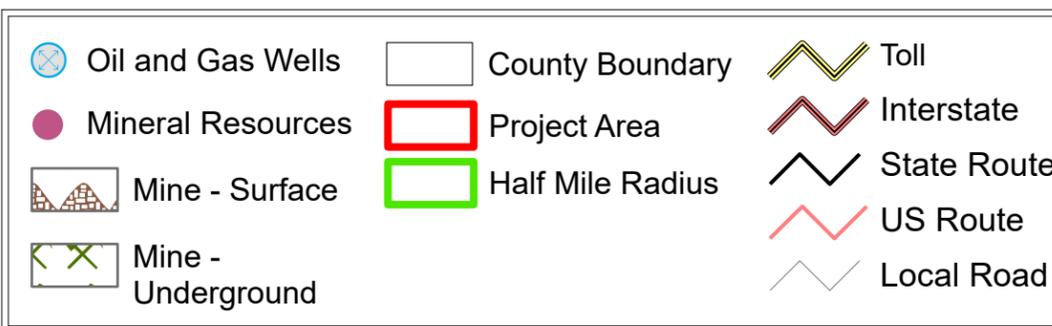
**Non Orthophotography**

**Data** - Obtained from the State of Indiana Geographical Information Office Library

**Orthophotography** - Obtained from Indiana Map Framework Data ([www.indianamap.org](http://www.indianamap.org))

**Map Projection:** UTM Zone 16 N **Map Datum:** NAD83

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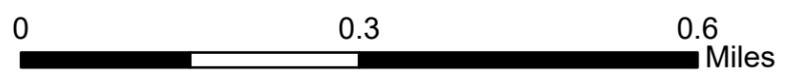


Red Flag Investigation - Hazardous Material Concerns  
 US 41 at Elkhorn Road  
 Des. No 1800224, Intersection Improvement  
 Knox County, Indiana



Indiana Office of Information Technology, Indiana University Spatial Data Portal, UITS, Woolpert Inc.,

|                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li> Brownfield</li> <li> RCRA Corrective Action Sites</li> <li> Confined Feeding Operation</li> <li> Construction/Demolition Site</li> <li> Infectious/Medical Waste Site</li> <li> Leaking Underground Storage Tank</li> <li> Manufactured Gas Plant</li> <li> NPDES Facilities</li> <li> NPDES Pipe Locations</li> <li> Open Dump Waste Site</li> </ul> | <ul style="list-style-type: none"> <li> RCRA Generator/TSD</li> <li> Restricted Waste Site</li> <li> Septage Waste Site</li> <li> Solid Waste Landfill</li> <li> State Cleanup Site</li> <li> Superfund</li> <li> Tire Waste Site</li> <li> Underground Storage Tank</li> <li> Voluntary Remediation Program</li> <li> Waste Transfer Station</li> </ul> | <ul style="list-style-type: none"> <li> Institutional Controls</li> <li> County Boundary</li> <li> Project Area</li> <li> Half Mile Radius</li> <li> Interstate</li> <li> State Route</li> <li> US Route</li> <li> Local Road</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



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**Map Projection:** UTM Zone 16 N **Map Datum:** NAD83

Indiana County Endangered, Threatened and Rare Species List

County: Knox



| Species Name                                           | Common Name                         | FED | STATE | GRANK | SRANK |
|--------------------------------------------------------|-------------------------------------|-----|-------|-------|-------|
| <b>Insect: Plecoptera (Stoneflies)</b>                 |                                     |     |       |       |       |
| <i>Agnetina annulipes</i>                              | Southern Stone                      |     | SE    | G5    | S1    |
| <i>Isogenoides varians</i>                             | Rock Island Springfly               |     | SE    | G3G4  | S1    |
| <b>Mollusk: Bivalvia (Mussels)</b>                     |                                     |     |       |       |       |
| <i>Arcidens confragosus</i>                            | Rock Pocketbook                     |     |       | G4    | S2    |
| <i>Cyprogenia stegaria</i>                             | Eastern Fanshell Pearlymussel       | LE  | SE    | G1Q   | S1    |
| <i>Epioblasma flexuosa</i>                             | Leafshell                           |     | SX    | GX    | SX    |
| <i>Epioblasma propinqua</i>                            | Tennessee Riffleshell               |     | SX    | GX    | SX    |
| <i>Epioblasma rangiana</i>                             | Northern Riffleshell                | LE  | SE    | G1    | S1    |
| <i>Epioblasma torulosa</i>                             | Tubercled Blossom                   | LE  | SX    | GX    | SX    |
| <i>Epioblasma triquetra</i>                            | Snuffbox                            | LE  | SE    | G3    | S1    |
| <i>Fusconaia subrotunda</i>                            | Longsolid                           | C   | SX    | G3    | SX    |
| <i>Hemistena lata</i>                                  | Cracking Pearlymussel               | LE  | SX    | G1    | SX    |
| <i>Lampsilis abrupta</i>                               | Pink Mucket                         | LE  | SX    | G2    | SX    |
| <i>Lampsilis ovata</i>                                 | Pocketbook                          |     | SSC   | G5    | S2    |
| <i>Obovaria retusa</i>                                 | Ring Pink                           | LE  | SX    | G1    | SX    |
| <i>Obovaria subrotunda</i>                             | Round Hickorynut                    | C   | SE    | G4    | S1    |
| <i>Plethobasus cicatricosus</i>                        | White Wartback                      | LE  | SX    | G1    | SX    |
| <i>Plethobasus cyphus</i>                              | Sheepnose                           | LE  | SE    | G3    | S1    |
| <i>Pleurobema clava</i>                                | Clubshell                           | LE  | SE    | G1G2  | S1    |
| <i>Pleurobema cordatum</i>                             | Ohio Pigtoe                         |     | SSC   | G4    | S2    |
| <i>Pleurobema plenum</i>                               | Rough Pigtoe                        | LE  | SE    | G1    | S1    |
| <i>Pleurobema rubrum</i>                               | Pyramid Pigtoe                      |     | SX    | G2G3  | SX    |
| <i>Potamilus capax</i>                                 | Fat Pocketbook                      | LE  | SE    | G2    | S1    |
| <i>Ptychobranthus fasciolaris</i>                      | Kidneyshell                         |     | SSC   | G4G5  | S2    |
| <i>Theliderma cylindrica</i>                           | Rabbitsfoot                         | LT  | SE    | G3G4  | S1    |
| <b>Insect: Coleoptera (Beetles)</b>                    |                                     |     |       |       |       |
| <i>Nicrophorus americanus</i>                          | American Burying Beetle             | LE  | SX    | G3    | SX    |
| <b>Insect: Ephemeroptera (Mayflies)</b>                |                                     |     |       |       |       |
| <i>Homoeoneuria ammophila</i>                          | Sand-loving Brush-legged Mayfly     |     | ST    | G4    | S2    |
| <i>Pseudiron centralis</i>                             | White Crabwalker Mayfly             |     | SE    | G5    | S1    |
| <i>Siphloplecton interlineatum</i>                     | Flapless Cleft-footed Minnow Mayfly |     | ST    | G5    | S2    |
| <b>Insect: Odonata (Dragonflies &amp; Damselflies)</b> |                                     |     |       |       |       |
| <i>Enallagma divagans</i>                              | Turquoise Bluet                     |     | SR    | G5    | S3    |
| <b>Fish</b>                                            |                                     |     |       |       |       |
| <i>Ammocrypta clara</i>                                | Western Sand Darter                 |     | SSC   | G3    | S2    |
| <i>Crystallaria asprella</i>                           | Crystal Darter                      |     |       | G3    | SX    |
| <i>Elassoma zonatum</i>                                | Banded Pygmy Sunfish                |     | SSC   | G5    | S1    |
| <i>Etheostoma squamiceps</i>                           | Spottail Darter                     |     |       | G4G5  | S2S3  |

Indiana Natural Heritage Data Center  
Division of Nature Preserves  
Indiana Department of Natural Resources  
This data is not the result of comprehensive county surveys.

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State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list  
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long-term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank  
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long-term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

Indiana County Endangered, Threatened and Rare Species List

County: Knox



| Species Name                                      | Common Name               | FED   | STATE | GRANK | SRANK |
|---------------------------------------------------|---------------------------|-------|-------|-------|-------|
| <i>Percina evides</i>                             | Gilt Darter               |       | SE    | G4    | S1    |
| <i>Percina uranidea</i>                           | Stargazing Darter         |       |       | G3    | SX    |
| <b>Amphibian</b>                                  |                           |       |       |       |       |
| <i>Cryptobranchus alleganiensis alleganiensis</i> | Eastern Hellbender        | C     | SE    | G3T2  | S1    |
| <b>Reptile</b>                                    |                           |       |       |       |       |
| <i>Farancia abacura reinwardtii</i>               | Western Mud Snake         |       | SSC   | G5T5  | SH    |
| <i>Kinosternon subrubrum subrubrum</i>            | Eastern Mud Turtle        |       | SE    | G5T5  | S2    |
| <i>Macrochelys temminckii</i>                     | Alligator Snapping Turtle | C     | SE    | G3G4  | SH    |
| <i>Nerodia erythrogaster neglecta</i>             | Copperbelly Water Snake   | PS:LT | SE    | G5T3  | S2    |
| <i>Ophedrys vernalis</i>                          | Smooth Green Snake        |       | SE    | G5    | S2    |
| <i>Pseudemys concinna concinna</i>                | Eastern River Cooter      |       | SE    | G5T5  | S1    |
| <b>Bird</b>                                       |                           |       |       |       |       |
| <i>Aimophila aestivalis</i>                       | Bachman's Sparrow         |       |       | G3    | SXB   |
| <i>Asio flammeus</i>                              | Short-eared Owl           |       | SE    | G5    | S2    |
| <i>Haliaeetus leucocephalus</i>                   | Bald Eagle                |       | SSC   | G5    | S2    |
| <i>Lanius ludovicianus</i>                        | Loggerhead Shrike         |       | SE    | G4    | S3B   |
| <i>Tyto alba</i>                                  | Barn Owl                  |       | SE    | G5    | S2    |
| <b>Mammal</b>                                     |                           |       |       |       |       |
| <i>Myotis lucifugus</i>                           | Little Brown Bat          | C     | SE    | G3    | S2    |
| <i>Myotis septentrionalis</i>                     | Northern Long Eared Bat   | LT    | SE    | G1G2  | S2S3  |
| <i>Myotis sodalis</i>                             | Indiana Bat               | LE    | SE    | G2    | S1    |
| <i>Nycticeius humeralis</i>                       | Evening Bat               |       | SE    | G5    | S1    |
| <i>Perimyotis subflavus</i>                       | Tricolored Bat            |       | SE    | G2G3  | S2S3  |
| <i>Sylvilagus aquaticus</i>                       | Swamp Rabbit              |       | SE    | G5    | S1    |
| <i>Taxidea taxus</i>                              | American Badger           |       | SSC   | G5    | S2    |
| <b>Vascular Plant</b>                             |                           |       |       |       |       |
| <i>Androsace occidentalis</i>                     | western rockjasmine       |       | ST    | G5    | S2    |
| <i>Azolla caroliniana</i>                         | Carolina mosquito-fern    |       | ST    | G5    | S3    |
| <i>Bacopa rotundifolia</i>                        | roundleaf water-hyssop    |       | ST    | G5    | S2    |
| <i>Callirhoe triangulata</i>                      | clustered poppy-mallow    |       | SE    | G3    | S1    |
| <i>Carex gigantea</i>                             | large sedge               |       | SE    | G4    | S1    |
| <i>Carex gravida</i>                              | heavy sedge               |       | SE    | G5    | S1    |
| <i>Carya pallida</i>                              | sand hickory              |       | SE    | G5    | S1    |
| <i>Catalpa speciosa</i>                           | northern catalpa          |       | ST    | G4?   | S3    |
| <i>Chelone obliqua var. speciosa</i>              | rose turtlehead           |       | WL    | G4T3  | S3    |
| <i>Clematis pitcheri</i>                          | Pitcher's leather-flower  |       | ST    | G4G5  | S3    |
| <i>Cyperus pseudovegetus</i>                      | green flatsedge           |       | ST    | G5    | S3    |
| <i>Echinodorus cordifolius</i>                    | creeping bur-head         |       | SE    | G5    | S1    |
| <i>Gentiana puberulenta</i>                       | downy gentian             |       | SE    | G4G5  | S1    |

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Indiana County Endangered, Threatened and Rare Species List

County: Knox



| Species Name                                                              | Common Name                 | FED | STATE | GRANK | SRANK |
|---------------------------------------------------------------------------|-----------------------------|-----|-------|-------|-------|
| <i>Gleditsia aquatica</i>                                                 | water-locust                |     | SE    | G5    | S1    |
| <i>Heterotheca camporum</i> var. <i>camporum</i>                          | hairy golden-aster          |     | ST    | G5TNR | S3    |
| <i>Hibiscus moscheutos</i> ssp. <i>lasiocarpos</i>                        | hairy-fruited hibiscus      |     | SE    | G5T4  | S1    |
| <i>Hypericum adpressum</i>                                                | creeping St. John's-wort    |     | SE    | G3    | S1    |
| <i>Iresine rhizomatosa</i>                                                | eastern bloodleaf           |     | ST    | G5    | S3    |
| <i>Isoetes melanopoda</i>                                                 | blackfoot quillwort         |     | ST    | G5    | S2    |
| <i>Monarda bradburiana</i>                                                | eastern bee-balm            |     | SE    | G5    | S1    |
| <i>Orobanche riparia</i>                                                  | bottomland broomrape        |     | SE    | G4?   | S1    |
| <i>Passiflora incarnata</i>                                               | purple passion-flower       |     | WL    | G5    | S3    |
| <i>Pedimelum tenuiflorum</i>                                              | few-flowered scurf-pea      |     | SX    | G5    | SX    |
| <i>Penstemon tubaeformis</i>                                              | tube penstemon              |     | SE    | G5    | S1    |
| <i>Phacelia ranunculacea</i>                                              | blue scorpionweed           |     | SE    | G4    | S1    |
| <i>Plantago cordata</i>                                                   | heart-leaved plantain       |     | SE    | G4    | S1    |
| <i>Prenanthes aspera</i>                                                  | rough rattlesnake-root      |     | ST    | G4?   | S3    |
| <i>Pteridium aquilinum</i> var. <i>pseudocaudatum</i>                     | bracken fern                |     | SX    | G5T5  | SX    |
| <i>Rorippa aquatica</i>                                                   | lake cress                  |     | SE    | G4?   | S1    |
| <i>Rudbeckia fulgida</i> var. <i>fulgida</i>                              | orange coneflower           |     | WL    | G5T4? | S3    |
| <i>Silene regia</i>                                                       | royal catchfly              |     | SE    | G3    | S1    |
| <i>Strophostyles leiosperma</i>                                           | slick-seed wild-bean        |     | WL    | G5    | S3    |
| <i>Taxodium distichum</i> var. <i>distichum</i>                           | bald cypress                |     | ST    | G5    | S2    |
| <i>Trichostema dichotomum</i>                                             | forked bluecurl             |     | WL    | G5    | S3    |
| <i>Vitis palmata</i>                                                      | catbird grape               |     | ST    | G4    | S3    |
| <b>High Quality Natural Community</b>                                     |                             |     |       |       |       |
| <i>Barrens - sand</i>                                                     | Sand Barrens                |     | SG    | G3    | S2    |
| <i>Forest - floodplain wet-mesic</i>                                      | Wet-mesic Floodplain Forest |     | SG    | G3?   | S3    |
| <i>Forest - upland mesic Southwestern Lowlands</i>                        | Southwestern Lowlands Mesic |     | SG    | GNR   | S1    |
|                                                                           | Upland Forest               |     |       |       |       |
| <i>Lake - pond</i>                                                        | Pond                        |     | SG    | GNR   | SNR   |
| <i>Wetland - swamp forest</i>                                             | Forested Swamp              |     | SG    | G2?   | S2    |
| <b>Other Significant Feature</b>                                          |                             |     |       |       |       |
| <i>Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade</i> | Water Fall and Cascade      |     |       | GNR   | SNR   |

Indiana Natural Heritage Data Center  
Division of Nature Preserves  
Indiana Department of Natural Resources  
This data is not the result of comprehensive county surveys.

Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting  
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list  
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long-term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank  
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long-term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

## APPENDIX F: Water Resources

# Waters of the U.S. Report

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## US 41 INTERSECTION IMPROVEMENTS



KNOX COUNTY

DES. No.

1800224

Prepared by:

**HNTB**

111 Monument Circle, Suite 1200  
Indianapolis, IN, 46204  
317.636.4682

**September 8, 2020**

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## 1. PROJECT INFORMATION

Date of Field Reconnaissance: April 9, 2020

### 1.1 LOCATION

The project is located approximately 1 mile south of the US 41 / Business 41 interchange in Knox County, Indiana.

- Section 17, Township 2 North, Range 10 West
- Vincennes, Indiana Quadrangle
- Lat/Long 38.631470 N, 87.531855 W – World Geodetic System 1984 (WGS84)

### 1.2 PROJECT DESCRIPTION

The Federal Highway Administration (FHWA) and Indiana Department of Transportation (INDOT), Vincennes District, are planning to proceed with the US 41 at Elkhorn Road intersection improvements project located approximately 1 mile south of Vincennes, Indiana. Proposed activities include construction of a Reduced Conflict Intersection (RCI) for northbound US 41 to the north of the intersection of US 41 and Elkhorn Road, and the removal of the existing northbound left turn lane at Elkhorn Road. Elkhorn Road west of US 41 will be modified to a right-in/right-out for US 41 southbound traffic. A northbound right turn lane from US 41 to Elkhorn Road will be added. Additional project activities include the construction of center curbs where Elkhorn Road intersects US 41, installation of new signage, and the installation of street lighting.

## 2. DESKTOP RECONNAISSANCE

### 2.1 SOIL ASSOCIATIONS AND SERIES TYPES

According to the Soil Survey Geographic (SSURGO) Database for Knox County, Indiana, the following mapped soils series are found within the US 41 investigated area (Attachment Page 6-7).

- **Conotton sandy loam (CoA):** very deep, well-drained soils formed in Wisconsinan age stratified outwash deposits. These soils are on outwash plains, stream terraces, kames, eskers, and beach ridges. Slope ranges from 0 to 50 percent. Conotton sandy loam is not considered a hydric soil. This soil type has a hydric rating of 0%.
- **Selma clay loam (Sc):** very deep, poorly drained soils formed in loamy outwash. They are on nearly level or slightly depressional parts of outwash plains, stream terraces, or lake plains. Slope ranges from 0 to 2 percent. Selma clay loam has a hydric soil rating of 100%.

### 2.2 NATIONAL WETLANDS INVENTORY

Based on the U.S. Fish and Wildlife National Wetlands Inventory (NWI) data ([www.fws.gov/wetlands/Data/State-Downloads.html](http://www.fws.gov/wetlands/Data/State-Downloads.html)) there is one wetland within the investigated area (Attachment Page 5). The wetland polygon represents the channel of Mantle Ditch (photo number 1-7). Mantle Ditch is represented as a riverine, lower perennial, unconsolidated bottom, permanently flooded, excavated wetland (R2UBHx). The nearest wetland outside of the

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investigated area is located approximately 0.12 mile northeast of the investigated area. The polygon represents a lacustrine, limnetic, unconsolidated bottom, permanently flooded, excavated wetland (L1UB1Hx).

### 2.3 HYDROLOGY

The investigated area lies within the Swan Pond Ditch watershed (HUC 051201130202). The investigated area lies within the floodplain of Mantle Ditch (Attachment Page 8).

## 3. FIELD RECONNAISSANCE

HNTB Indiana staff performed a field review of the investigated area on April 9, 2020. The purpose was to determine the presence of Waters of the U.S. within the investigated area. HNTB Indiana staff collected data during the field review to appropriately characterize the investigated area and determine the presence or absence of jurisdictional waters. The field investigation area encompassed the area required for construction access. HNTB staff photographed select features and areas of interest throughout the investigated area. A photo location map and selected photographs are included as Attachment Page 10-26.

The proposed investigated area was analyzed using the methods outlined in the Routine Determination, On-site Inspection Necessary procedure in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Midwest Region* (US Army corps of Engineers, 2010). Identification indicator status of plant species utilized the 2018 Midwest Region National Wetland Plant List. Field GIS data was collected using a Trimble® hand-held GPS with sub-meter accuracy.

## 4. WATERS

The April 2020 field reconnaissance for the US 41 investigated area identified three streams (Mantle Ditch, UNT 1 to Mantle Ditch and UNT 2 to Mantle Ditch). Information obtained during the field investigation is provided in detail below. A National Hydrography Dataset flowline is visible running parallel to US 41, in the northwest portion of the investigated area (Attachment Page 4 and photo numbers 50-59). No water features were observed in the investigated area northwest of the US 41 / Elkhorn Road intersection.

### 4.1 WETLANDS

No wetlands were observed during the April 2020 investigation. Roadway spill slopes convey water to roadside drainage features that carry water through the investigated area during storm events. Although Selma clay loam, a hydric soil, may be present in the southern portion of the investigated area, the roadway spill slopes prevent ponding and pooling in the investigated area. Vegetation throughout the investigated area consisted of cutleaf teasel (*Dipsacus laciniatus*, UPL), (*Rosa multiflora*, FACU), bush honeysuckle (*Diervilla lonicera*, UPL), and tall fescue (*Schedonorus arundinaceus*, FACU). Therefore, conditions conducive for the formation of wetlands are not present within the investigated area.

### 4.2 STREAMS

The field investigation resulted in the identification of three likely jurisdictional streams (Mantle Ditch, UNT 1 to Mantle Ditch and UNT 2 to Mantle Ditch). A total of approximately 109 linear feet of Mantle Ditch, 152 linear feet of UNT 1 to Mantle Ditch and 140 linear feet of UNT 2 to Mantle Ditch lie within the investigated area. Vegetation throughout the

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investigated area was dominated by cutleaf teasel (*Dipsacus laciniatus*, UPL), reed canary grass (*Phalaris arundinacea*, FACW), multiflora rose (*Rosa multiflora*, FACU), bush honeysuckle (*Diervilla lonicera*, UPL), threepetal bedstraw (*Galium trifidum*, FACW) and sandbar willow (*Salix interior*, FACW). The ordinary high water mark (OHWM) for each stream was obtained at a representative location, outside of the influence of the existing structure. Characteristics of the streams are summarized in Table 1.

#### UNT 1 TO MANTLE DITCH

UNT 1 to Mantle Ditch is an ephemeral stream feature that begins approximately 152 feet north of Mantle Ditch and flows south where it reaches its confluence with Mantle Ditch. Approximately 152 feet of this feature was evaluated as part of this investigation. The UNT 1 to Mantle Ditch substrate consists of 100% silt. The OHWM of UNT 1 to Mantle Ditch is 1.83 feet wide by 0.25 feet deep. According to the classification codes developed by Cowardin et al. (1979), this stream feature would be classified as a riverine, ephemeral (R6) resource. Based on a review of historic aerial imagery, the stream appears to convey jurisdictional waters that originate in the adjacent agricultural fields as well as roadside drainage. UNT 1 to Mantle Ditch flows into the Wabash River, a traditional navigable waterway (TNW), via Mantle Ditch, the Vieke Drainage System, Swan Pond Ditch, and the Deshee River. This feature is not noted on the USGS StreamStats website, (<https://water.usgs.gov/osw/streamstats/indiana.html>); therefore, it likely has an upstream drainage area less than one square mile. Following a qualitative assessment, this resource is a poor-quality feature based on a lack of in-stream cover or development.

#### UNT 2 TO MANTLE DITCH

UNT 2 to Mantle Ditch is an ephemeral stream feature that begins approximately 140 feet south of Mantle Ditch and flows north where it reaches its confluence with Mantle Ditch. Approximately 140 feet of this feature was evaluated as part of this investigation. The UNT 2 to Mantle Ditch substrate consists of 80% silt and 20% gravel. The ordinary high-water mark (OHWM) of UNT 2 to Mantle Ditch is 4 feet wide by 0.92 feet deep. According to the classification codes developed by Cowardin et al. (1979), this stream feature would be classified as a riverine, ephemeral (R6) resource. Based on a review of historic aerial imagery, the stream appears to convey jurisdictional waters that originate in the adjacent agricultural fields as well as roadside drainage. UNT 2 to Mantle Ditch flows into the Wabash River, a TNW, via Mantle Ditch, the Vieke Drainage System, Swan Pond Ditch, and the Deshee River. This feature is not noted on the USGS StreamStats website, (<https://water.usgs.gov/osw/streamstats/indiana.html>); therefore, it likely has an upstream drainage area less than one square mile. Following a qualitative assessment, this resource is a poor-quality feature based on a lack of in-stream cover or development.

#### MANTLE DITCH

Mantle Ditch is a perennial stream feature that begins east of the investigated area and flows southwest underneath US 41. Approximately 109 feet of this feature was evaluated as part of this investigation. The Mantle Ditch substrate consists of 50% silt and 50% sand. The right and left banks of the channel exhibit minimal erosion. The ordinary high-water mark (OHWM) of Mantle Ditch is 25 feet wide by 2.5 feet deep. According to the classification codes developed by Cowardin et al. (1979), this stream feature would be classified as a riverine, lower perennial, unconsolidated bottom, permanently flooded, excavated (R2UBHx) resource. This likely jurisdictional feature is hydrologically connected to the Wabash River, a TNW, via the Vieke Drainage System, Swan Pond Ditch, and the Deshee River. According to the USGS StreamStats website, (<https://water.usgs.gov/osw/streamstats/indiana.html>), Mantle Ditch drains approximately 5.677 square miles

upstream of the US 41 bridge (Attachments Page 9). Following a qualitative assessment, this resource is an average-quality feature based on limited in-stream cover.

Table 1: Stream and Waterway Summary Table

| Stream Name           | Photo # | Lat/Long                   | OHWM                                | Quality | Substrate            | USGS Blue Line | Riffles/Pools | Waters of U.S. |
|-----------------------|---------|----------------------------|-------------------------------------|---------|----------------------|----------------|---------------|----------------|
| UNT 1 to Mantle Ditch | 8-13    | 38.63235 N<br>87.531213 W  | 1.83 feet wide by<br>0.25 feet deep | Poor    | 100% Silt            | No             | No            | Yes            |
| UNT 2 to Mantle Ditch | 14-19   | 38.630973 N<br>87.531446   | 4 feet wide by<br>0.92 feet dep     | Poor    | 80% Silt/ 20% Gravel | No             | No            | Yes            |
| Mantle Ditch          | 1-7     | 38.631479 N<br>87.531859 W | 25 feet wide by<br>2.5 feet deep    | Average | 50% Silt/ 50% Sand   | Yes            | No            | Yes            |

### 4.3 ROADSIDE DRAINAGE FEATURES

As illustrated in the ground level photographs included as Attachment Pages 11-26, roadside ditches observed throughout the investigated area do not contain OHWMs that would result from conveying jurisdictional waters. All roadside ditches are contained within INDOT right-of-way. The banks of the three roadside ditches were lined with tall fescue (*Schedonorus arundinaceus*, FACU), and fuller’s teasel (*Dipsacus fullonum*, FACU) was observed along the banks of RSD 1 and RSD 3. Roadside drainage is summarized in Table 2.

Table 2: Roadside Ditch Summary Table

| Feature Name | Photo # | Latitude    | Longitude   | Linear Feet in the Investigated Area | Substrate | USGS Blue Line | Waters of U.S. |
|--------------|---------|-------------|-------------|--------------------------------------|-----------|----------------|----------------|
| RSD 1        | 20-23   | 38.632236 N | 87.532177 W | 602                                  | Silt      | No             | No             |
| RSD 2        | 24-27   | 38.630787 N | 87.532501 W | 214                                  | Silt      | No             | No             |
| RSD 3        | 28-34   | 38.635663 N | 87.530725 W | 1,650                                | Silt      | No             | No             |

### 4.4 OPEN WATERS

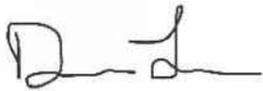
Site investigations did not identify open water features within the investigated area.

## 5. CONCLUSION

The April field review for the US 41 Intersection Improvement project identified three likely jurisdictional features within the identified survey area (UNT 1 to Mantle Ditch, UNT 2 to Mantle Ditch and Mantle Ditch). All three streams are likely waters of the U.S. with hydrologic connectivity to the Wabash River, a TNW. No wetlands or roadside ditches with OHWMs were identified within the survey area.

If construction exceeds the limits of the survey review area illustrated in this document, further field investigation will be needed. This report is this office's best judgment of water resources that are likely to be under federal jurisdiction, based on the guidelines set forth by the U.S. Army Corps of Engineers (USACE). The final determination of jurisdictional waters is ultimately the responsibility of the USACE. The INDOT Office of Environmental Services should be contacted immediately if impacts occur.

This waters determination has been prepared based on the best available information, interpreted in the light of the investigator's training, experience and professional judgement in conformance with the 1987 *Corps of Engineers Wetlands Delineation Manual*, the appropriate regional supplement, the USACE *Jurisdictional Determination Form Instructional Guidebook*, and other appropriate agency guidelines.



Dan Logsdon, Scientist I

PREPARERS:

| HNTB Inc., Staff | Position                | Contributing Effort                         |
|------------------|-------------------------|---------------------------------------------|
| Richard Connolly | Science Project Manager | Project Management<br>Field Data Collection |
| Dan Logsdon      | Scientist I             | Field Data Collection<br>Report Preparation |

**Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM**

**BACKGROUND INFORMATION**

**A. REPORT COMPLETION DATE FOR PJD:** 9/8/2020

**B. NAME AND ADDRESS OF PERSON REQUESTING PJD:** Dan Logsdon, 111 Monument Circle, Suite 1200, Indianapolis, IN 46204; 317-917-5336; dlogsdon@hntb.com

**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:**

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**

The FHWA and INDOT are proposing (Des. No. 1800224) to improve the intersection of US 41 and Elkhorn Road in Knox County, Indiana. The project is located approximately 1 mile south of the US 41/Business 41 interchange. More specifically, the project is located in Section 17, Township 2 North, Range 10 West in Vincennes Township. Project plans are still being developed.

**(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: Indiana      County/parish/borough: Knox      City: Vincennes

Center coordinates of site (lat/long in degree decimal format):

Lat.: 38.631470      Long.: -87.531855

Universal Transverse Mercator: Zone 16 - Easting: 453708 Northing: 4276016

Name of nearest waterbody: Mantle Ditch

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

Office (Desk) Determination. Date:

Field Determination. Date(s):

**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH “MAY BE” SUBJECT TO REGULATORY JURISDICTION.**

| Site number  | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource “may be” subject (i.e., Section 404 or Section 10/404) |
|--------------|----------------------------|-----------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| UNT 1        | 38.63235                   | -87.531213                  | 0.01 / 152                                                                                   | Non-wetland                                                     | Section 404                                                                                               |
| UNT 2        | 38.630973                  | -87.531446                  | 0.01 / 140                                                                                   | Non-wetland                                                     | Section 404                                                                                               |
| Mantle Ditch | 38.631479                  | -87.531859                  | 0.06 / 109                                                                                   | Non-wetland                                                     | Section 404                                                                                               |
|              |                            |                             |                                                                                              |                                                                 |                                                                                                           |
|              |                            |                             |                                                                                              |                                                                 |                                                                                                           |
|              |                            |                             |                                                                                              |                                                                 |                                                                                                           |

- 1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
- 2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "*may be*" waters of the U.S. and/or that there "*may be*" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:  
Map: Aerial, USGS topo, StreamStats, Web of Soil, NWI.
- Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - Office concurs with data sheets/delineation report.
  - Office does not concur with data sheets/delineation report. Rationale: \_\_\_\_\_.
- Data sheets prepared by the Corps: \_\_\_\_\_.
- Corps navigable waters' study: \_\_\_\_\_.
- U.S. Geological Survey Hydrologic Atlas: NHD Hydrography layers, 2014.
  - USGS NHD data.
  - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: Vincennes 1:24,000 and 1:6,000 Quadrangles.
- Natural Resources Conservation Service Soil Survey. Citation: Web of Soil Service, 2020.
- National wetlands inventory map(s). Cite name: NWI Mapper Online Tool 2020.
- State/local wetland inventory map(s): \_\_\_\_\_.
- FEMA/FIRM maps: IDNR Floodplain GIS Database.
- 100-year Floodplain Elevation is: 410.5 ft (National Geodetic Vertical Datum of 1929)
- Photographs:  Aerial (Name & Date): 2016 - NAIP  
or  Other (Name & Date): Ground Photos Taken April 9, 2020
- Previous determination(s). File no. and date of response letter: \_\_\_\_\_.
- Other information (please specify): \_\_\_\_\_.

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

\_\_\_\_\_  
Signature and date of  
Regulatory staff member  
completing PJD

**Daniel Logsdon** Digitally signed by Daniel Logsdon  
Date: 2020.08.31 16:33:13 -0400'  
\_\_\_\_\_  
Signature and date of  
person requesting PJD  
(REQUIRED, unless obtaining  
the signature is impracticable)<sup>1</sup>

<sup>1</sup> Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

## APPENDIX G: Public Involvement

## APPENDIX H: Air Quality

Indiana Department of Transportation (INDOT)  
 State Preservation and Local Initiated Projects FY 2020 - 2024

| SPONSOR                                                                                                                                                                               | CONTR ACT # / LEAD DES | STIP NAME | ROUTE  | WORK TYPE                                    | LOCATION                                                                        | DISTRICT  | MILES | FEDERAL CATEGORY | Estimated Cost left to Complete Project* | PROGRAM             | PHASE | FEDERAL        | MATCH          | 2020         | 2021         | 2022           | 2023           | 2024           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------|--------|----------------------------------------------|---------------------------------------------------------------------------------|-----------|-------|------------------|------------------------------------------|---------------------|-------|----------------|----------------|--------------|--------------|----------------|----------------|----------------|
| Indiana Department of Transportation                                                                                                                                                  | 41470 / 1800183        | Init.     | SR 67  | HMA Overlay, Preventive Maintenance          | From 0.52 mi W of SR-159 to 0.69 mi E of SR-159 Jct.                            | Vincennes | 1.205 | STPBG            |                                          | Road ROW            | RW    | \$347,200.00   | \$86,800.00    |              |              | \$434,000.00   |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 41470 / 1800183        | A 18      | SR 67  | HMA Overlay, Preventive Maintenance          | From 0.52 mi W of SR-159 to 0.69 mi E of SR-159 Jct. (Bicknell )                | Vincennes | 1.205 | STBG             | \$11,402,489.88                          | Road Construction   | CN    | \$7,048,000.00 | \$1,762,000.00 |              |              | \$10,000.00    | \$8,800,000.00 |                |
|                                                                                                                                                                                       |                        |           |        |                                              |                                                                                 |           |       |                  |                                          | Road Consulting     | PE    | \$424,000.00   | \$106,000.00   | \$230,000.00 | \$300,000.00 |                |                |                |
|                                                                                                                                                                                       |                        |           |        |                                              |                                                                                 |           |       |                  |                                          | Road ROW            | RW    | \$8,000.00     | \$2,000.00     |              |              | \$10,000.00    |                |                |
| Comments:Adding FY20 PE funds of \$230,000.00. FY21 PE funds of \$300,000.00. FY22 RW funds of \$10,000.00. FY22 CN funds of \$10,000.00 and FY23 CN funds of \$8,800,000.00. No MPO. |                        |           |        |                                              |                                                                                 |           |       |                  |                                          |                     |       |                |                |              |              |                |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 41472 / 1800224        | Init.     | US 41  | Other Intersection Improvement               | At Elkhorn Road, South of Vincennes                                             | Vincennes | .3    | NHPP             |                                          | Safety Consulting   | PE    | \$276,000.00   | \$69,000.00    | \$345,000.00 |              |                |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 42135 / 1900801        | A 03      | US 41  | Small Structure Pipe Lining                  | Over 3+14 N JCT SR-550                                                          | Vincennes | 0     | NHPP             | \$396,000.00                             | Bridge Construction | CN    | \$316,800.00   | \$79,200.00    |              |              | \$396,000.00   |                |                |
| Comments:Amend 2020-2024 STIP. Adding FY22 CN \$396,000.00. No MPO.                                                                                                                   |                        |           |        |                                              |                                                                                 |           |       |                  |                                          |                     |       |                |                |              |              |                |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 42136 / 1900567        | A 01      | US 50  | HMA Overlay, Preventive Maintenance          | From Illinois State Line to W Jct US 41                                         | Vincennes | 1.63  | NHPP             | \$6,178,000.00                           | Road Construction   | CN    | \$4,412,800.00 | \$1,103,200.00 |              |              | \$5,516,000.00 |                |                |
|                                                                                                                                                                                       |                        |           |        |                                              |                                                                                 |           |       |                  |                                          | Road Consulting     | PE    | \$529,600.00   | \$132,400.00   | \$662,000.00 |              |                |                |                |
| Comments:Amend 2020-2024 STIP. Adding FY20 PE \$662,000.00, FY22 CN \$5,516,000.00. No MPO.                                                                                           |                        |           |        |                                              |                                                                                 |           |       |                  |                                          |                     |       |                |                |              |              |                |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 42161 / 1600728        | A 04      | US 41  | Small Structure Replacement                  | 2.20 mi N SR-241                                                                | Vincennes | 0     | NHPP             | \$1,430,432.00                           | Bridge Construction | CN    | \$1,144,345.60 | \$286,086.40   |              |              | \$1,430,432.00 |                |                |
| Comments:Amend 2020-2024 STIP. FY22 CN \$1,430,432.00. No MPO.                                                                                                                        |                        |           |        |                                              |                                                                                 |           |       |                  |                                          |                     |       |                |                |              |              |                |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 42198 / 1900272        | A 03      | SR 441 | HMA Overlay, Preventive Maintenance          | From 0.12 mi E US-41(E. Ramsey Rd) to Illinois/Indiana State Bridge             | Vincennes | 2.54  | STPBG            | \$5,134,557.00                           | Road Construction   | CN    | \$3,595,645.60 | \$898,911.40   |              |              |                |                | \$4,494,557.00 |
|                                                                                                                                                                                       |                        |           |        |                                              |                                                                                 |           |       |                  |                                          | Road Consulting     | PE    | \$472,000.00   | \$118,000.00   | \$590,000.00 |              |                |                |                |
|                                                                                                                                                                                       |                        |           |        |                                              |                                                                                 |           |       |                  |                                          | Road ROW            | RW    | \$40,000.00    | \$10,000.00    |              |              |                | \$50,000.00    |                |
| Comments:Amend 2020-2024 STIP. FY20 PE \$590,000.00, FY23 RW \$50,000.00, FY24 CN \$4,494,557.00. No MPO.                                                                             |                        |           |        |                                              |                                                                                 |           |       |                  |                                          |                     |       |                |                |              |              |                |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 42656 / 1902863        | A 15      | US 50  | Auxiliary Lanes, Accel & Decel or Turn Lanes | at CR 300E/Monty Road (WB), CR 400W/Mt Zion Road (WB), Old US 50/Palmyra Road & | Vincennes | 2.6   | NHPP             | \$1,600,000.00                           | Safety Consulting   | PE    | \$128,000.00   | \$32,000.00    | \$160,000.00 |              |                |                |                |
| Comments:Adding FY20 PE \$160,000.00. No MPO.                                                                                                                                         |                        |           |        |                                              |                                                                                 |           |       |                  |                                          |                     |       |                |                |              |              |                |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 42720 / 2000724        | A 17      | SR 241 | Bridge Deck Overlay                          | over PLASS DITCH, .80mi N US 41                                                 | Vincennes | 0     | STBG             | \$585,250.00                             | Bridge Construction | CN    | \$352,000.00   | \$88,000.00    |              |              |                | \$440,000.00   |                |
|                                                                                                                                                                                       |                        |           |        |                                              |                                                                                 |           |       |                  |                                          | Bridge Consulting   | PE    | \$116,200.00   | \$29,050.00    |              | \$145,250.00 |                |                |                |
| Comments:Adding FY21 PE \$145,250.00, FY23 CN \$440,000.00. No MPO.                                                                                                                   |                        |           |        |                                              |                                                                                 |           |       |                  |                                          |                     |       |                |                |              |              |                |                |                |
| Indiana Department of Transportation                                                                                                                                                  | 42746 / 2000856        | A 17      | SR 59  | HMA Overlay, Preventive Maintenance          | From SR 58 to SR 67                                                             | Vincennes | 1.61  | STBG             | \$1,355,800.00                           | Road Construction   | CN    | \$780,000.00   | \$195,000.00   |              |              |                | \$15,000.00    | \$960,000.00   |

## APPENDIX I: Additional Information

Note: Some pages have been removed from the INDOT Mini-Scope for brevity

## Call Application Report Project ( Mini Scope)

|              |                                |                |                                  |               |           |
|--------------|--------------------------------|----------------|----------------------------------|---------------|-----------|
| Date:        | 12/12/2017                     | District:      | VINCENNES                        | <b>SCORE:</b> | <b>74</b> |
| DES:         | 1800224                        | Sub-District:  | Vincennes                        |               |           |
| Proposed FY: | 2023                           | Asset Group:   | SAFETY                           |               |           |
| Work Type:   | Other Intersection Improvement | Work Category: | Intersection Improvement Project |               |           |

| Project Location      |                                                      |                 |              |                                             |              |                    |                 |
|-----------------------|------------------------------------------------------|-----------------|--------------|---------------------------------------------|--------------|--------------------|-----------------|
| Route:                | US 41                                                | City/Town:      | Vincennes    | County 1                                    | Knox         | County 2           |                 |
| RP Start:             | 51.05                                                | Latitude Start: | 38°37'54.4"N | Longitude Start:                            | 87°31'54.0"W |                    |                 |
| RP End:               | 51.35                                                | Latitude End:   | 38°38'09.6"N | Longitude End:                              | 87°31'51.3"W |                    |                 |
| AAFT FY:              |                                                      | AAFT:           |              | % Trucks:                                   |              |                    |                 |
| Length:               | 0.33                                                 | # Lanes:        | 4            | Lane Mi:                                    | 1.32         |                    |                 |
| Func. Class:          | Other Principal Arterial (OPA)                       |                 |              | Area:                                       |              | NHS:               | Other NHS Route |
| Str. #                |                                                      | NBI #:          |              | Bridge / Culvert: Length (FT) / Width (FT): |              | Bridge Area (SFT): | Year Built:     |
| Location Description: | US 41 and Elkhorn Road, South of Vincennes, Knox Co. |                 |              |                                             |              |                    |                 |

SEE IT: WHAT IS THE CURRENT AND PROJECTED CONDITION AND WHY IS THIS A PROBLEM (FOCUS ON THE PROBLEM):

This intersection services both the INDOT main campus, fire station, and the Knox County Industrial Park area. There is a significant number of staff vehicles and several trucks coming in and out of these facilities. The east approach is laden with heavy traffic during certain times of the day. In addition to the traffic, the east approach has a steep grade that creates difficulties for all traffic movements (traffic crossing the northbound lanes to make a left turn on to southbound US 41, traffic crossing both the north and southbound lanes continuing westbound on Elkhorn Rd. and traffic making a right turn to go northbound on US 41). The issues created include line of sight issues and issues with traffic starting at stopped position on a steep grade, which are compounded issues for truck traffic.

According to The Hazard Elimination Program-Manual on Improving Safety of Indiana Road Intersections and Sections, if the ICF (Index Crash Frequency) and ICC (Index Crash Cost) values for a location are both greater than 2, the location is a "high crash" location. At this location the ICF is 2.40 and the ICC is 1.60. The majority of the accidents have occurred from westbound traffic with southbound traffic. The second highest number of accident is from eastbound traffic (west approach) with northbound traffic.

**INSERT ONE OR TWO PICTURES OF PRIMARY PROBLEM:**



|                                        |  |               |                       |       |                                 |        |
|----------------------------------------|--|---------------|-----------------------|-------|---------------------------------|--------|
| DATE AND TYPE OF LAST MAJOR TREATMENT: |  |               |                       | DATE: |                                 |        |
| PROJECT CONDITION RATINGS:             |  | LOS:          | Crash Rate:           | 1.6   | ICC:                            | 2.40   |
| Wearing Surface:                       |  | Deck:         | Bridge/Culvert Super: |       | Substructure (Bridge/ Culvert): |        |
| Type I Culverts/ pipes:                |  | Bridge Scour: | Bridge Paint:         |       | Culvert                         |        |
| IRI:                                   |  | PCR:          | RUT:                  |       | Friction #:                     | Other: |

INTENT/ PURPOSE OF PROJECT (INITIAL STATEMENT OF ESSENTIAL PROJECT PURPOSE):

The intent of this project is to reduce the number of crashes, especially crashes with injury. Additionally, with the amount of development occurring in this area, traffic is only expected to increase at this intersection, which will increase the likelihood that this intersection will have an increase in crashes if improvements are not made to this intersection. The current trend appears to be accidents increasing due to traffic from the east approach, which is not surprising given the volume of traffic using this approach.

|                       |    |            |  |           |  |
|-----------------------|----|------------|--|-----------|--|
| Completed FULL SCOPE: | NO | KPI Delta: |  | KPI UNIT: |  |
|-----------------------|----|------------|--|-----------|--|

## PRELIMINARY ALTERNATIVES THAT ARE CONTEMPLATED (ANALYSED) WITH COSTS:

A traffic signal is an alternative, but creates the potential for other types of traffic accidents and will disrupt the flow of traffic along US 41.

The most viable option for improving this intersection appears to be a J-turn. The J-turn is generally considered safer than a signal by reducing the number of traffic conflict points and the conflict points that are present typically result in less severe crashes. Additionally, the J-turn will have negligible effects on the flow of traffic along US 41.

There are several things to consider regarding the design of J-turns at this location:

1. Perform a traffic study (coordinate with Knox County Development Corporation) to determine traffic impacts from long term development plans. Based on impact study, determine if alternate recommendations are necessary for this intersection.
2. Determine if US 41 southbound bridge (NBI 014600) will require widening for proper installation of the south J-turn. At this time, it is anticipated that widening will be required and will be funded through safety. If widening is necessary, it is anticipated that a separate Des. No. will be necessary for the work. The estimated cost for the widening is \$950,000.00.
2. Consider allowing left turns at Elkhorn Rd.
3. Median widths are relatively narrow at this location. Evaluate type of trucks and their turning radii. If necessary, consider implementing a "loam" to accommodate turning trucks.
4. Consider the close proximity of the intersection just south of Elkhorn Rd. Will a J-turn installation at the Elkhorn Rd. intersection create additional traffic at the south intersection (consider information from traffic study)?
5. Signage shall be provided to allow for proper flow of traffic.
6. Lighting shall be provided along the entire length of the J-turns for safety.
7. Consider traffic enforcement when the J-turns are first placed in operation to ensure proper traffic usage.

A minimum of two public meetings shall be anticipated to acclimate the traveling public to this uncommon type of intersection improvement.

As previously indicated, the J-turns at US 231 and SR 62 and US 231 at SR 68 can be referenced for design ideas.

Innovative alternative solutions will still be considered and are encouraged.

In addition to the J-turn, US 41 NB and SB acceleration lanes and a US 41 NB right turn lane shall be considered to allow for better traffic flow, especially truck traffic (\$700,000.00). A design exception shall be evaluated for the right turn lane length to avoid widening of the US 41 NB bridge. Additionally, update markings at Elkhorn Rd. Adjustment of the vertical alignment of Elkhorn Rd. would also be beneficial, but shall be evaluated in cooperation and through discussions with the Local Public Agency since the majority of the work will be require beyond INDOT R/W.

## CONSEQUENCES IF NO ACTION IS TAKEN (DO NOTHING ALTERNATIVE IS SELECTED):

Possibly having an increasing trends in more crossing crashes. (Note, they are already showing an increase right now taking place.)

## SECONDARY CONSIDERATIONS OR GOALS WITH COSTS:

There are no secondary considerations.

Attach extra sheets as necessary to fully describe the alternatives.

Will Further Analysis/Assessment be required beyond this form?

YES

SOLVE IT: Project Recommendations and Costs

QUANTIFIABLE PRIMARY GOAL(S) OF PROJECT (WHAT ARE WE PURCHASING SUCH AS CONDITION, SERVICE LIFE, LOS, OR CRF):

To increase safety by decreasing the numbers of right angle crashes currently taking place.

|                                  |                      |                  |  |
|----------------------------------|----------------------|------------------|--|
| Estimated Total Project Costs:   | \$3,655,000.00       | COMMENTS         |  |
| Right of Way Purchase (RW1):     | COST: \$0.00         |                  |  |
| Right of Way Services (RW2):     | COST: \$10,000.00    |                  |  |
| Preliminary Engineering 1 (PE1): | COST: \$345,000.00   | 10% of CN + Env. |  |
| Preliminary Engineering 2 (PE2): | COST: \$0.00         |                  |  |
| Maintenance of Traffic:          | COST: \$0.00         |                  |  |
| Railroad PE (RR1):               | COST: \$0.00         |                  |  |
| Railroad PE (RR2):               | COST: \$0.00         |                  |  |
| Environmental Study:             | COST: \$0.00         |                  |  |
| Utilities PE (UT1):              | COST: \$0.00         |                  |  |
| Utilities CN (UT2):              | COST: \$50,000.00    |                  |  |
| Construction (CN):               | COST: \$3,250,000.00 |                  |  |
| Construction Engineering (CE):   | COST: \$0.00         |                  |  |
| Relinquishment Payment (RQP):    | COST: \$0.00         |                  |  |
| Other Considerations:            | COST: \$0.00         |                  |  |

Other Projects within Limits

|      |     |            |           |
|------|-----|------------|-----------|
| DES: | FY: | Work Type: | Location: |
| DES: | FY: | Work Type: | Location: |
| DES: | FY: | Work Type: | Location: |

Miscellaneous Notes

|                                                                            |  |      |
|----------------------------------------------------------------------------|--|------|
| ANTICIPATED NUMBER OF CONSTRUCTION SEASONS TO COMPLETE(1, 2 or 3 seasons): |  | 1 FY |
| ANTICIPATED NUMBER OF YEARS TO COMPLETE DESIGN (1, 2 or 3 fiscal years):   |  | 1    |

CALL HISTORY:

Attachments

|                       |     |                                   |     |                   |  |
|-----------------------|-----|-----------------------------------|-----|-------------------|--|
| Pictures              |     | Asset Team Scoring Sheet:         | YES | Mobility History: |  |
| Spreadsheets (calcs): | YES | Engineer Assessment:              |     |                   |  |
| Solution Schematic:   |     | Bridge/Culvert Inspection Report: |     |                   |  |
| Cost Calculations:    |     | Accident History:                 | YES |                   |  |
| Location Map:         | YES | Pathway Data:                     |     |                   |  |

Additional Comments

Other items relevant to the project not specifically listed elsewhere.

NOTE: Appropriate environmental and assessment process need to be followed.

Report Prepared By and Approved By

|                                    |                          |                             |                           |              |
|------------------------------------|--------------------------|-----------------------------|---------------------------|--------------|
| Report Prepared By and Approved By |                          | Title:                      | Signature                 |              |
| Prepared by:                       | Randall L. Phegley, P.E. | District Asset Engineer     | <i>Randall L. Phegley</i> |              |
| Reviewed by:                       | Terry Bough, P.E.        | District Traffic Engineer   | <i>Terry Bough</i>        |              |
| Reviewed by:                       | Duane Decker, P.E.       | District Scoping Manager    | <i>Duane Decker</i>       |              |
| Reviewed by:                       | Khalil Dughaiish, P.E.   | System Asset Manager        | <i>Khalil Dughaiish</i>   |              |
| Approval by:                       | Valerie Cockrum          | Technical Services Director | <i>Valerie Cockrum</i>    | APPROVED ON: |

## Safety Asset Team Scoring Sheet

|           |                                              |                                 |             |
|-----------|----------------------------------------------|---------------------------------|-------------|
| DES:      |                                              | Date:                           | 12/12/2017  |
| Analyst:  | RLP                                          | Project Cost (today's dollars): | \$3,655,000 |
| District: | Vincennes                                    | Route:                          | US 41       |
| Location: | US 41 and Elkhorn Road, in Knox County       |                                 |             |
| City:     | South of Vincennes                           | County:                         | Knox        |
| Notes:    | I <sub>cc</sub> = 2.3; I <sub>cf</sub> = 1.3 |                                 |             |

| Factor                                                     | Rating                                        | Score | Weight             | Total     |
|------------------------------------------------------------|-----------------------------------------------|-------|--------------------|-----------|
| #1 Traffic Safety (I <sub>cc</sub> -based) (type number=>) | 2.30                                          | 5     | 6                  | 30        |
| #2 Compliance with Current Standards                       | Somewhat Substandard                          | 2     | 2                  | 4         |
| #3 Operational Status                                      | Adequate Operational Condition                | 3     | 3                  | 9         |
| #4 Cost-Effectiveness (value)                              | (imported from worksheet Factor #4)           | 3     | 6                  | 18        |
| #5 Public and Other Interests                              | Very High Level of Positive Support           | 5     | 2                  | 10        |
| #6 Route Continuity and Corridor Completion                | Positive Effect on Consistency and Conformity | 3     | 1                  | 3         |
|                                                            |                                               |       | <b>Team Score</b>  | <b>74</b> |
| #7 Earmarks & External Contributions                       | (if applicable, refer to business rules)      | 0     | 7                  | 0         |
|                                                            |                                               |       | <b>Total Score</b> | <b>74</b> |

## Index of Crash Frequency and Cost - Form F1

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|          |                          |             |
|----------|--------------------------|-------------|
| Location | US 41 at Elkhorn Rd      |             |
|          | near Vincennes, Knox Co. |             |
| GIS      | 38.6331553               | -87.5314438 |
| Post     | 51+30                    |             |
| Analyst  | Terry Bough              |             |
| Date     | 3/21/2018                |             |

**INPUT**

|                                                      |                                             |  |
|------------------------------------------------------|---------------------------------------------|--|
| Road Facility Type                                   | Unsignalized Rural State-Local Intersection |  |
| Major Road AADT (veh/day)                            | 12688                                       |  |
| T-intersection Indicator (1 if present, 0 otherwise) | 0                                           |  |
| First Year with Crash Data (yyyy)                    | 2013                                        |  |
| Last Year with Crash Data (yyyy)                     | 2016                                        |  |
| Number of Crashes (crash/period)                     |                                             |  |
| Fatal and Incapacitating Injury Crashes              | 6                                           |  |
| Non-Incapacitating and Possible Injury Crashes       | 2                                           |  |
| Property Damage Only Crashes                         | 5                                           |  |
| Route or Road Type                                   | Unsignalized Rural State-Local Intersection |  |
| Average Crash Costs (\$)                             |                                             |  |
| Fatal and Incapacitating Injury Crashes              | 459600                                      |  |
| Non-Incapacitating and Possible Injury Crashes       | 32700                                       |  |
| Property Damage Only Crashes                         | 5000                                        |  |
| Crash Cost Year (yyyy)                               | 2013                                        |  |
| <b>OUTPUT</b>                                        |                                             |  |
| Expected Crash Frequency (crash/year)                |                                             |  |
| Fatal and Incapacitating Injury Crashes              | 0.057                                       |  |
| Non-Incapacitating and Possible Injury Crashes       | 0.32                                        |  |
| Property Damage Only Crashes                         | 0.98                                        |  |
| All Crashes                                          | 1.35                                        |  |
| Index of Crash Frequency                             | <b>1.29</b>                                 |  |
| Index of Crash Cost                                  | <b>2.33</b>                                 |  |

## Index of Crash Frequency and Cost - Form F1

Page 2/2

|          |                          |             |
|----------|--------------------------|-------------|
| Location | US 41 at Elkhorn Rd      |             |
|          | near Vincennes, Knox Co. |             |
| GIS      | 38.6331553               | -87.5314438 |
| Post     | 51+30                    |             |
| Analyst  | Terry Bough              |             |
| Date     | 3/21/2018                |             |

Comments:

# Crash Data

## Legend

- KNOX\_CO\_CRASH\_DATA\_2014
- KNOX\_CO\_CRASH\_DATA\_2015
- ▲ KNOX\_CO\_CRASH\_DATA\_2016
- ★ KNOX\_CO\_CRASH\_DATA\_Partial\_2017

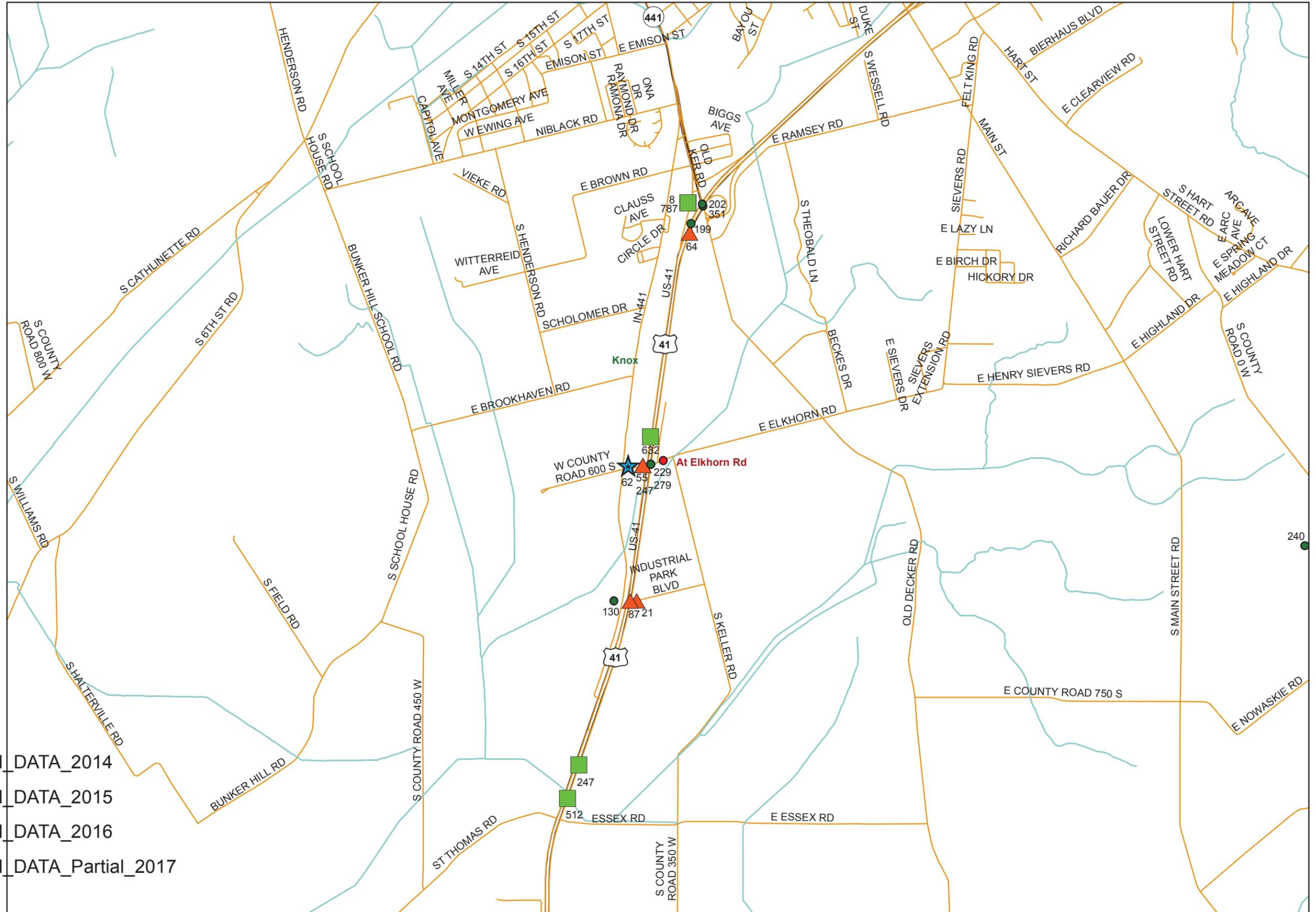


DIAGRAM OF COLLISION REPORTS

US 41 & Elkhorn Road

Study Period: 1/1/2014 to 12/31/2016 Location: 33  
 District: Vincennes County: Knox City/Town: Vincennes  
 Analyst: TMA QC: RLH Date: 6/20/2017



| YEAR  | REPORTS |
|-------|---------|
| 2014  | 5       |
| 2015  | 3       |
| 2016  | 4       |
| TOTAL | 12      |

**NOTES**  
 1) Crashes with determinable location are shown in diagram. Crash total may not match ARIES database.  
 2) Crashes on diagram do not represent exact crash locations; they are approximated based on available information.  
 3) Diagram not to scale.

| Object Symbols |                                  | Collision Symbols |                      | Fixed Object Codes        |
|----------------|----------------------------------|-------------------|----------------------|---------------------------|
|                | MOVING VEHICLE                   |                   | REAR END             | 01 - BRIDGE or OVERPASS   |
|                | TURNING VEHICLE                  |                   | HEAD ON              | 02 - BUILDING             |
|                | BACKING VEHICLE                  |                   | OVERTAKING / CUT-OFF | 03 - CULVERT or DITCH     |
|                | OUT OF CONTROL                   |                   | SIDESWIPE - SAME     | 04 - CURB                 |
|                | PARKED VEHICLE                   |                   | SIDESWIPE - OPPOSITE | 05 - GUARDRAIL or BARRIER |
|                | PEDESTRIAN                       |                   | RIGHT ANGLE          | 06 - EMBANKMENT           |
|                | BICYCLE                          |                   | LEFT TURN            | 07 - FENCE                |
|                | ANIMAL                           |                   | OVERTURNED           | 08 - TRAFFIC POLE         |
|                | DEBRIS IN ROADWAY                |                   |                      | 09 - UTILITY POLE         |
|                | DRIVEWAY CRASH                   |                   |                      | 10 - SIGN                 |
|                | FATAL CRASH                      |                   |                      | 11 - TREE / SHRUB         |
|                | INJURY CRASH - INCAPACITATING    |                   |                      | 12 - CONSTRUCTION BARRIER |
|                | INJURY CRASH - NONINCAPACITATING |                   |                      | 13 - CRASH ATTENUATOR     |
|                | PDO CRASHES (IF > 1)             |                   |                      | 88 - OTHER                |
|                |                                  |                   |                      | 99 - UNKNOWN              |

### **Location 33: US 41 at Elkhorn Road, Vincennes, Knox Co, Vincennes District**

#### **Field-Check on 6/22/17**

- Terry Bough (INDOT Vincennes District)
- Tom Ford (INDOT Central Office)
- Ted Andrews (CHA)
- Claudio Figueroa-Bueno (CHA)

#### **Intersection Basics**

- Un-Signalized – NB/SB approach free-flow; EB/WB approach stop controlled
- US 41 NB approach: 1 LT, 1 Thru; 1 shared Thru / RT; 40-foot grass median
- US 41 SB approach: 1 LT, 2 Thru, 1 RT; 40-foot grass median
- Elkhorn Road EB approach: 1 shared LT / Thru / RT; no median
- Elkhorn Road WB approach: 1 shared LT / Thru / RT; no median
- Posted speed on US 41 NB Approach = 60 mph
- Posted speed on US 41 SB Approach = 60 mph
- Posted speed on Elkhorn Road EB/WB Approaches = Unposted

This is a four approach unsignalized intersection. The land use along the US 41 corridor is primarily agricultural, residential and manufacturing. There are residences on the northeast and northwest corners. On the southwest corner, there is some manufacturing and agricultural uses. On the southeast corner, the US 41 Business Park is currently being developed and will be a big traffic generator when fully built out.

#### **Crash History (ARIES 2014-2016)**

- 12 crashes/3 years
- 6 Incapacitating Injury
- 3 Non-Incapacitating Injury
- 3 PDO

#### **Output from HAT 3.0** (analyzed as Rural Un-Signalized State-Local Intersection):

- $I_{cc} = 2.40$
- $I_{cf} = 1.60$

#### **Manner of Collision**

- 33% Right Angle (3 SB and 1 NB)
- 25% Sideswipe Same Direction (2 SB and 1 NB)
- 17% Left Turn (1 SB and 1 NB)

#### **Primary Factor**

- 67% Failure to Yield Right of Way
- 17% Unsafe Lane Movement
- 8% Improper Turning
- 8% Following Too Closely

### **Incapacitating Injury Crashes**

1. Vehicle travelling north, sideswiped another northbound vehicle north of the intersection.
2. Vehicle travelling west, rear ended another vehicle traveling west.
3. Vehicle travelling west, pulled out in front of a vehicle traveling south (SB left turning truck blocking view)
4. Vehicle travelling west, pulled out in front of a vehicle traveling south
5. Vehicle travelling west, pulled out in front of a vehicle traveling south turning west onto Elkhorn Road
6. Vehicle travelling east, turned left (north) out in front of a vehicle traveling north

### **Other information of note from crash data**

- 3 crashes involved northbound vehicles
- 7 crashes involved southbound vehicles (failure to yield right of way)
- 42% of the crashes occurred on Monday
- 33% of the crashes occurred on Thursday
- 11 of the 12 crashes happened during daylight hours
- 33% of the crashes happened during the 7-8AM hour
- 25% of the crashes happened during the 11AM-12PM hour

### **Preliminary Identified Problems**

1. There are few Speed limit signs on US 41 and no speed limit signs on Elkhorn.
2. Worn pavement markings on all approaches
3. The stop bars on the Elkhorn Road approaches are approximately 40-45 feet from the US 41 edge of travel way.
4. The corner radius on the northeast and southwest corners is too large resulting in a wide intersection approach.
5. There are Crossroad (W2-1) warning signs on the US 41 approaches and a Stop Ahead (W3-1) on the east approach of Elkhorn but not on the west approach.
6. The intersection is located on the northern half of the US 41 Business Park. This intersection will attract Business Park traffic going to and from the north on US 41. The intersection does not have a northbound or southbound acceleration lanes. These would be beneficial to the increased truck traffic from the Business Park. The intersection also does not have a northbound right turn lane.
7. It was observed that the Elkhorn Road approaches are lower than US 41. This would hinder the sight distance of the entire intersection for traffic on Elkhorn Road. Intersection sight distance is not optimal especially for a wide road such as US 41.
8. The US 41 Business Park is just east of the intersection. Most of the business park, approximately 180 acres, remains undeveloped. As the business park develops with new tenants, additional demand will be placed on Elkhorn Road, Industrial Park Blvd and US 41.
9. The intersection does not have a flashing beacon nor roadway lighting.

### **Preliminary Recommendations**

1. Police enforcement of posted speed limits and failure to yield right of way
2. Paint/install/refresh striping on all approaches
3. Move stop bars on the Elkhorn approaches closer to the intersection.
4. For the short term, the corner radius on the northeast and southwest corners should be reduced with pavement markings. For the long term, excess pavement should be removed.

5. Install Stop Ahead W3-1 warning sign on the west approach of Elkhorn Road. Install flashers on top of W2-1 signs on US 41.
6. Install speed limit signs on both the US 41 and Elkhorn Road approaches.
7. Install northbound acceleration lane on US 41. This lane would help traffic, especially truck traffic, turning north on US 41 from the Business Park. Likewise, a southbound acceleration lane should also be constructed.
8. Install northbound right turn lane on US 41. This lane would help traffic, especially truck traffic, turning into the US 41 Business Park from the south. There is a bridge approximately 515 feet south of Elkhorn Road. Based on the INDOT Driveway Permit Manual, the ideal right turn lane should have a 100-ft (taper), 50-ft (storage) and 545-ft (deceleration). This total length would be 695-ft which is in excess of the available length of 515-ft. A right turn lane can be provided with space available; the length of deceleration would be compromised and shortened. Regarding traffic from the US 41 Business Park, most traffic from the south would use the Industrial Park Blvd. over Elkhorn Road. However a right turn lane, although shortened, can be provided for Elkhorn Road.
9. The vertical alignment of the east approach of Elkhorn Road should be raised at the US 41 intersection to maximize the intersection sight distance and operations.
10. Coordinate with Knox County Development Corporation to determine the type and magnitude of traffic generated from the proposed industrial park. Short and Long term improvements at the intersection will be influenced by this development. A traffic impact study showing the full build out of the US 41 Business Park will reveal improvements to the Elkhorn Road and Industrial Park Blvd intersections. Improvements could include signalization or a J-Turn type intersection.

**SUMMARY SHEET**

|                |                        |           |                     |
|----------------|------------------------|-----------|---------------------|
| INTERSECTION:  | US 41 and Elkhorn Road | DISTRICT: | Vincennes           |
| CITY:          | N/A                    | COUNTY:   | Knox                |
| DATE OF COUNT: | 10/26/17               | BY:       | TY & JF (Miovision) |
| ANALYSIS DATE: | 12/20/17               | BY:       | RLP                 |

|                                |       |
|--------------------------------|-------|
| TRAVEL DIRECTION OF MAJOR ROAD | N - S |
|--------------------------------|-------|

**WARRANT 1 - 8 HOUR VEHICULAR VOLUMES**

Condition A - Minimum Vehicular Volumes

With RTOR Adjustments The minimal requirements are NOT met.  
Without RTOR Adjustments The minimal requirements are NOT met.

Condition B - Interruption of Continuous Traffic

With RTOR Adjustments The minimal requirements are NOT met.  
Without RTOR Adjustments The minimal requirements are NOT met.

Criteria C - Combination of Conditions A & B

With RTOR Adjustments: The minimal requirements are NOT met.  
Without RTOR Adjustments: The minimal requirements are NOT met.

**WARRANT 2 - Four Hour Volumes**

With RTOR Adjustments The minimal requirements are NOT met.  
Without RTOR Adjustments The minimal requirements are NOT met.

**WARRANT 3 - Peak Hour**

Condition A: Peak Hour Delay

This Warrant is Apparently Non-Applicable

Condition B: 4 Hour Vehicle Volumes

This Warrant is Apparently Non-Applicable

**WARRANT 4- Minimum Pedestrian Volume**

THIS CRITERIA WAS NOT CONSIDERED BECAUSE  
The minimal requirements are NOT met. THERE WERE NO, OR MINIMAL PEDESTRIANS

**WARRANT 5 - School Crossing**

THIS CRITERIA WAS NOT CONSIDERED BECAUSE  
THERE WERE NO, OR MINIMAL, CHILDREN CROSSING

**WARRANT 6 - Progressive Movement**

The minimal requirements are NOT met.

**WARRANT 7 - Accident Experience**

With RTOR Adjustments The minimal requirements are NOT met.  
Without RTOR Adjustments The minimal requirements are NOT met.

**WARRANT 8 - Systems Warrant**

The minimal requirements ARE met.

**WARRANT 9 - Intersection Near a Railroad Crossing**

This Warrant is Apparently Non-Applicable

**WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME**  
**With RTOR Adjustments:**

**Without RTOR Adjustments:**

**Condition A - Minimum Vehicular Volume**

|                                                                       |                                                            |  |  | 0 Hours Mtg | Choose With X                       |
|-----------------------------------------------------------------------|------------------------------------------------------------|--|--|-------------|-------------------------------------|
| WITH RIGHT TURN ADJUSTMENTS                                           | Using Max # lanes on Major Rd and # lanes on East App      |  |  | 0           | <input checked="" type="checkbox"/> |
|                                                                       | Using Max # lanes on Major Rd and # lanes on West App      |  |  | 0           | <input checked="" type="checkbox"/> |
|                                                                       | XX Using Max # lanes on Major Rd and Max# lanes on Minr Rd |  |  | 0           | <input checked="" type="checkbox"/> |
| <b>With RTOR Adjustments The minimal requirements are NOT met.</b>    |                                                            |  |  |             |                                     |
| WITHOUT RIGHT TURN ADJUSTMENTS                                        | Using Max # lanes on Major Rd and # lanes on East App      |  |  | 0           | <input type="checkbox"/>            |
|                                                                       | Using Max # lanes on Major Rd and # lanes on West App      |  |  | 0           | <input type="checkbox"/>            |
|                                                                       | XX Using Max # lanes on Major Rd and Max# lanes on Minr Rd |  |  | 0           | <input checked="" type="checkbox"/> |
| <b>Without RTOR Adjustments The minimal requirements are NOT met.</b> |                                                            |  |  |             |                                     |

**Condition A Requirements**

| LANES              | WARRANT (FULL) | VALUE 70% | VALUE USED | Number of Compliant Hours |            |                |            |
|--------------------|----------------|-----------|------------|---------------------------|------------|----------------|------------|
|                    |                |           |            | no rt adjust              |            | less rt. turns |            |
|                    |                |           |            | INDIV ROAD                | BOTH ROADS | INDIV ROAD     | BOTH ROADS |
| MAJOR ROAD         | 1              | 500       | 350        |                           |            |                |            |
| TOTAL BOTH APP.    | 2              | 600       | 420        | 12                        |            | 12             |            |
| Minr Rd/Max Lanes  |                |           | 105        | 0                         | 0          | 0              | 0          |
| MINOR ROAD  E.APP. | 1              | 150       | 105        | 0                         | 0          | 0              | 0          |
| APPROACH   W.APP.  | 2              | 200       | 140        | 0                         | 0          | 0              | 0          |

**Condition B - Interruption of Continuous Traffic**

|                                                                       |                                                            |  |  | 1 Hours Mtg | Choose With X                       |
|-----------------------------------------------------------------------|------------------------------------------------------------|--|--|-------------|-------------------------------------|
| WITH RIGHT TURN ADJUSTMENTS                                           | Using Max # lanes on Major Rd and # lanes on East App      |  |  | 1           | <input checked="" type="checkbox"/> |
|                                                                       | Using Max # lanes on Major Rd and # lanes on West App      |  |  | 0           | <input checked="" type="checkbox"/> |
|                                                                       | XX Using Max # lanes on Major Rd and Max# lanes on Minr Rd |  |  | 1           | <input checked="" type="checkbox"/> |
| <b>With RTOR Adjustments The minimal requirements are NOT met.</b>    |                                                            |  |  |             |                                     |
| WITHOUT RIGHT TURN ADJUSTMENTS                                        | Using Max # lanes on Major Rd and # lanes on East App      |  |  | 5           | <input type="checkbox"/>            |
|                                                                       | Using Max # lanes on Major Rd and # lanes on West App      |  |  | 0           | <input type="checkbox"/>            |
|                                                                       | XX Using Max # lanes on Major Rd and Max# lanes on Minr Rd |  |  | 5           | <input checked="" type="checkbox"/> |
| <b>Without RTOR Adjustments The minimal requirements are NOT met.</b> |                                                            |  |  |             |                                     |

**Condition B Requirements**

| LANES              | WARRANT (FULL) | VALUE 70% | VALUE USED | Number of Compliant Hours |            |                |            |
|--------------------|----------------|-----------|------------|---------------------------|------------|----------------|------------|
|                    |                |           |            | no rt adjust              |            | less rt. turns |            |
|                    |                |           |            | INDIV ROAD                | BOTH ROADS | INDIV ROAD     | BOTH ROADS |
| MAJOR ROAD         | 1              | 750       | 525        |                           |            |                |            |
| TOTAL BOTH APP.    | 2              | 900       | 630        | 12                        |            | 12             |            |
| Minr Rd/Max Lanes  |                |           | 53         | 5                         | 5          | 1              | 1          |
| MINOR ROAD  E.APP. | 1              | 75        | 53         | 5                         | 5          | 1              | 1          |
| APPROACH   W.APP.  | 2              | 100       | 70         | 0                         | 0          | 0              | 0          |

**Condition C Requirements (Combination of Condition A & B)**

| Are Condition A and Condition B fulfilled to 80 % of the volume requirements? |     |             |      | Hrs Satisfied w/RTOR | Hrs Satisfied-NoRTOR |
|-------------------------------------------------------------------------------|-----|-------------|------|----------------------|----------------------|
| Condition A Maj Rd Vol                                                        | 336 | Minr Rd Vol | 84   | 0                    | 3                    |
| Condition B Maj Rd Vol                                                        | 504 | Minr Rd Vol | 42.4 | 3                    | 7                    |

**With RTOR Adjustments: The minimal requirements are NOT met.**  
**Without RTOR Adjustments: The minimal requirements are NOT met.**

**WARRANT 2 - FOUR HOUR VEHICULAR VOLUME**

With RTOR Adjustments The minimal requirements are NOT met.

Without RTOR Adjustments The minimal requirements are NOT met.

| NO RTOR RED'CT'N |                           |                           |                     |                                   | WITH RTOR RED'CT'N |                           |                           |                     |                                   |      |
|------------------|---------------------------|---------------------------|---------------------|-----------------------------------|--------------------|---------------------------|---------------------------|---------------------|-----------------------------------|------|
| N & S App.       | MINOR STREET EAST APPR'CH | MINOR STREET WEST APPR'CH | HOUR MEETS REQM'NTS | G'METRY USED FOR POSITIVE WARRANT | N & S App.         | MINOR STREET EAST APPR'CH | MINOR STREET WEST APPR'CH | HOUR MEETS REQM'NTS | G'METRY USED FOR POSITIVE WARRANT |      |
| 909              | 59                        | 7                         | 0                   | none                              | 6.00               | 905                       | 22                        | 7                   | 0                                 | none |
| 1086             | 99                        | 17                        | 1                   | N-E                               | 7.00               | 1079                      | 54                        | 17                  | 0                                 | none |
| 710              | 36                        | 11                        | 0                   | none                              | 8.00               | 706                       | 23                        | 11                  | 0                                 | none |
| 697              | 16                        | 7                         | 0                   | none                              | 9.00               | 694                       | 8                         | 7                   | 0                                 | none |
| 756              | 27                        | 12                        | 0                   | none                              | 10.00              | 753                       | 15                        | 12                  | 0                                 | none |
| 741              | 79                        | 12                        | 0                   | none                              | 11.00              | 735                       | 34                        | 12                  | 0                                 | none |
| 765              | 47                        | 9                         | 0                   | none                              | 12.00              | 762                       | 26                        | 9                   | 0                                 | none |
| 836              | 32                        | 8                         | 0                   | none                              | 13.00              | 833                       | 18                        | 8                   | 0                                 | none |
| 865              | 37                        | 18                        | 0                   | none                              | 14.00              | 859                       | 19                        | 18                  | 0                                 | none |
| 888              | 47                        | 9                         | 0                   | none                              | 15.00              | 884                       | 34                        | 9                   | 0                                 | none |
| 954              | 87                        | 19                        | 1                   | N-E                               | 16.00              | 944                       | 44                        | 19                  | 0                                 | none |
| 1157             | 91                        | 15                        | 1                   | N-E                               | 17.00              | 1149                      | 47                        | 15                  | 0                                 | none |
| 0                | 0                         | 0                         | 0                   | none                              | 18.00              | 0                         | 0                         | 0                   | 0                                 | none |
| 0                | 0                         | 0                         | 0                   | none                              | 19.00              | 0                         | 0                         | 0                   | 0                                 | none |
| 0                | 0                         | 0                         | 0                   | none                              | 20.00              | 0                         | 0                         | 0                   | 0                                 | none |
| 0                | 0                         | 0                         | 0                   | none                              | 21.00              | 0                         | 0                         | 0                   | 0                                 | none |
|                  |                           |                           | 3                   |                                   |                    |                           |                           | 0                   |                                   |      |

**WARRANT 3 - PEAK HOUR**

**Condition A - Peak Hour Delay**

This Warrant is Apparently Non-Applicable

|                                    | East App. | West App. |           | Tot.Vol | E App.Vol | W App.Vol |            |
|------------------------------------|-----------|-----------|-----------|---------|-----------|-----------|------------|
| Actual Peak Hr - Side Street Delay | 0.328     | 0.080     | Estimated | 1060    | 87        | 19        | Act. Count |
| N - S Peak Hr - Side Street Delay  | 0.328     | 0.080     | Estimated | 1060    | 87        | 19        | Act. Count |
| E - W Peak Hr - Side Street Delay  | 0.445     | 0.083     | Estimated | 1263    | 91        | 15        | Act. Count |

- THE TOTAL PEAK HOUR STOPPED DELAY FROM THE SIDE STREET IS ----- 0.328 HOURS  
 THE REQUIRED STOPPED DELAY FROM THE SIDE STREET IS----- 4 HOURS  
 DOES THE STOPPED DELAY EQUAL OR EXCEED THE MIN REQUIREMENT?
- THE HIGH VOLUME ON THE SIDE ST APP'S DURING THE PEAK HOUR IS ? 87  
 THE REQUIRED VOLUME ON THE SIDE STREET DURING THE PEAK HR IS: 100  
 DOES THE VOLUME ON THE SIDE STREET EXCEED THE MINIMUM REQUIREMENT?
- THE TOTAL INTERSECTIONAL VOLUME DURING THE PEAK HOUR IS: 1060  
 THE REQUIRED INTERSECTIONAL VOLUME IS----- 800  
 DOES THE INTERSECTIONAL VOLUME EQUAL OR EXCEED THE MIN REQUIREMENT?

**Condition B - Peak Hour Volume**

This Warrant is Apparently Non-Applicable

| MAJOR STREET VOLUME BOTH DIR PEAK HR | MINOR ST EAST APPR'CH VOLUME PEAK HR | MINOR ST WEST APPR'CH VOLUME PEAK HR | REQUIRED MINOR STREET HIGH VOL APPROACH | HOUR MEETS REQM'NTS |
|--------------------------------------|--------------------------------------|--------------------------------------|-----------------------------------------|---------------------|
| 1157                                 | 91                                   | 15                                   | 80                                      | YES                 |
| GEOMETRICS USED                      |                                      |                                      | N-E                                     |                     |

**WARRANT 4 - PEDESTRIAN VOLUME**

**THIS CRITERIA WAS NOT CONSIDERED BECAUSE THERE WERE NO, OR MINIMAL PEDESTRIANS**

The minimal requirements are NOT met.

HIGH VOLUME CROSSWALK ACROSS THE MAJ. STREET IS ACROSS THE

THE MAJ. STREET HAS A RAISED MEDIAN OF ADEQUATE SIZE -----

Y= The number of Pedestrians Crossing the Major Street

X= The Major Street Volume - Total of Both Directions

Equation Used for 4 Hour Warrant

Number of Hours that 4 Hr. Warrant is Satisfied

Equation Used for Pedestrian Peak Hour

Number of Hours that Ped Peak Hour is Satisfied

**WARRANT 5 - SCHOOL CROSSING**

**THIS CRITERIA WAS NOT CONSIDERED BECAUSE THERE WERE NO, OR MINIMAL, CHILDREN CROSSING**

Crosswalk Volumes Used were across the No Approach Used

IS THERE AN ESTABLISHED SCHOOL CROSSING ACROSS ANY OF THE DENOTED APPROACHES?

|                   | N.APP. | S. APP. | E.APP. | W. APP. |
|-------------------|--------|---------|--------|---------|
| ****ANSWER (Y/N)  | N      | N       | N      | N       |
| WIDTH OF ST. (FT) | 0      | 0       | 0      | 0       |

NEITHER THE N. OR S. APPROACH IS THE SCHOOL CROSSING

| PERIOD  | TIME OF DAY |            |      | NUM OF CHILDR | REQ'D VEH VOLUME | Actual or Estmatd VEH VOLUME | PERIOD SATISF'D |
|---------|-------------|------------|------|---------------|------------------|------------------------------|-----------------|
|         | START       | *****      | END  |               |                  |                              |                 |
| MORNING | 0.00        | ----TO---- | 0.00 | NA            | NA               | NA                           | NA              |
| NOON    | 0.00        | ----TO---- | 0.00 | NA            | NA               | NA                           | NA              |
| EVENING | 0.00        | ----TO---- | 0.00 | NA            | NA               | NA                           | NA              |

NEITHER THE E. OR W. APPROACH IS THE SCHOOL CROSSING

| PERIOD  | TIME OF DAY |            |      | NUM OF CHILDR | REQ'D VEH VOLUME | ACT OR ESTIMATD VEH VOLUME | PERIOD SATISF'D |
|---------|-------------|------------|------|---------------|------------------|----------------------------|-----------------|
|         | START       | *****      | END  |               |                  |                            |                 |
| MORNING | 0.00        | ----TO---- | 0.00 | NA            | NA               | NA                         | NA              |
| NOON    | 0.00        | ----TO---- | 0.00 | NA            | NA               | NA                         | NA              |
| EVENING | 0.00        | ----TO---- | 0.00 | NA            | NA               | NA                         | NA              |

**WARRANT 6 - COORDINATED SIGNAL SYSTEM**

The minimal requirements are NOT met.

- 1) ARE ADJACENT TRAFFIC SIGNALS GREATER THAN 1000 FT AWAY? (Y/N)-----
- 2) DO ADJACENT SIGNALS PROVIDE THE NECESSARY DEGREE OF VEHICLE PLATOONING AND SPEED GROUPING ? (Y/N)-----
- 3) COULD THE PROPOSED TRAFFIC SIGNAL AND ADJACENT TRAFFIC SIGNALS CONSTITUTE A PROGRESSIVE TRAFFIC SIGNAL SYSTEM?-----

**WARRANT 8 - ROADWAY NETWORK**

**With RTOR Adjustments: The minimal requirements ARE met.**

**Without RTOR Adjustments: The minimal requirements ARE met.**

1) Are the intersecting Roads or Streets considered MAJOR ROUTES ?

|                             |   |
|-----------------------------|---|
| MAJOR STREET CHARACTERISTIC | 1 |
| MINOR STREET CHARACTERISTIC | 1 |

IS THIS THE INTERSECTION OF 2 OR MORE MAJOR ROUTES?

|                                                                   |      |
|-------------------------------------------------------------------|------|
| 2) NUM. OF HOURS EXCEEDING 1000 VPH                               | 3    |
| PEAK HOUR TOTAL VOLUME-----                                       | 1263 |
| DOES THIS YEARS PROJECT'D PEAK HOUR TOTAL VOLUME EXCEED 1000 VEH. | 0    |

|                                                  |                                                       |  |   |
|--------------------------------------------------|-------------------------------------------------------|--|---|
| 3) 5 Year Projection: With RTOR                  | One or more of the following are satisfied for 8 hrs. |  | Y |
| Criteria 1 Condition A--- Num of Hours Satisfied | 0                                                     |  |   |
| Criteria 1 Condition B--- Num of Hours Satisfied | 3                                                     |  |   |
| Criteria 1 Condition C-A- Num of Hours Satisfied | 0                                                     |  |   |
| Criteria 1 Condition C-B- Num of Hours Satisfied | 3                                                     |  |   |
| Criteria 2----- Num of Hours Satisfied           | 1                                                     |  |   |
| Criteria 3----- Peak Hour Criteria Satisfied     | Y                                                     |  |   |

|                                                  |                                                       |  |   |
|--------------------------------------------------|-------------------------------------------------------|--|---|
| 3) 5 Year Projection: Without RTOR               | One or more of the following are satisfied for 8 hrs. |  | Y |
| Criteria 1 Condition A--- Num of Hours Satisfied | 0                                                     |  |   |
| Criteria 1 Condition B--- Num of Hours Satisfied | 5                                                     |  |   |
| Criteria 1 Condition C-A- Num of Hours Satisfied | 3                                                     |  |   |
| Criteria 1 Condition C-B- Num of Hours Satisfied | 7                                                     |  |   |
| Criteria 2----- Num of Hours Satisfied           | 4                                                     |  |   |
| Criteria 3----- Peak Hour Criteria Satisfied     | Y                                                     |  |   |

**WARRANT 9 - INTERSECTION NEAR A GRADE CROSSING**

This Warrant is Apparently Non-Applicable

- 1) Clear Storage distance from the center of the tracks to the STOP LINE or YIELD LINE
- 2) Hour of Train Usage (or Peak Hour)-----
- 3) Traffic Volumes Used----- Main Line  RR Side Approach
- 4) Adjustment Factor Used -----  Side App Adjusted Volume
- 5) Required Side Road Volume-----
- 6) Does the (adjusted) side road volume meet the requirements?-----

**WARRANT 7 - CRASH EXPERIENCE**

**With RTOR Adjustments The minimal requirements are NOT met.**

**Without RTOR Adjustments The minimal requirements are NOT met.**

- 1) HAVE LESS RESTRICTIVE MEASURES BEEN IMPLEMENTED AND TESTED ?--(Y/N)  
 HAVE THE MEASURES PROVEN UNSATISFACTORY ?------(Y/N)  
 LIST MEASURES:

|   |
|---|
| Y |
| Y |

2) Accident Data For The Intersection of: US 41 and Elkhorn Road

Date From: 01/01/14  
 Date To: 03/04/17

| Accident Type        | NUMBER | PD | PI | FATALITY | TOTAL |
|----------------------|--------|----|----|----------|-------|
| REAR END             | 1      | 2  | 0  | 0        | 2     |
| HEAD ON              | 2      | 0  | 0  | 0        | 0     |
| SAME DIR SIDESWIPE   | 3      | 2  | 0  | 0        | 2     |
| OPP DIR SIDESWIPE    | 4      | 0  | 0  | 0        | 0     |
| OFF ROAD COLLISION   | 5      | 0  | 0  | 0        | 0     |
| RIGHT ANGLE          | 6      | 3  | 6  | 0        | 9     |
| OPP LT.TRN & RT. TRN | 7      | 0  | 0  | 0        | 0     |
| OPP THRU &LEFT TRN   | 8      | 0  | 0  | 0        | 0     |
| FR LTSd THRU &LT TRN | 9      | 0  | 0  | 0        | 0     |
| FR RTSd THRU &LT TRN | 10     | 0  | 0  | 0        | 0     |
| SAME DIR LT&LT TRN   | 11     | 0  | 0  | 0        | 0     |
| SAME DIR TH&LT TRN   | 12     | 0  | 0  | 0        | 0     |
| OPP DIR LT TURNS     | 13     | 0  | 0  | 0        | 0     |
| FR LTSd THRU &RT TRN | 14     | 0  | 0  | 0        | 0     |
| SAME DIR RT&RT TRN   | 15     | 0  | 0  | 0        | 0     |
| SAME DIR TH&RT TRN   | 16     | 0  | 0  | 0        | 0     |
| FR RT THRU & RT TRN  | 17     | 0  | 0  | 0        | 0     |
| OPP THRU & RT TURN   | 18     | 0  | 0  | 0        | 0     |

Comment "STOP" signs on the Minor County Road approaches  
 0

WITHIN A 12 MONTH PERIOD, WERE THERE 5 OR MORE REPORTED ACCIDENTS OF THE TYPE NORMALLY CONSIDERED CORRECTIBLE BY THE INSTALLATION OF A TRAFFIC SIGNAL. (ie #6)------(Y/N)

|   |
|---|
| Y |
|---|

3) WILL A SIGNAL AT THIS LOCATION SERIOUSLY DISRUPT TRAFFIC FLOW?-----(Y/N)

|   |
|---|
| Y |
|---|

4) THERE EXISTS A VEHICULAR AND/OR PEDESTRIAN VOLUME GREATER THAN 80% OF FULL CONDITIONS A OR B OF CRITERIA 1 OR CONDITIONS LISTED IN CRITERIA 4

|                 | RTOR Reduction  |         | 80 %             |         | MAJOR & MINOR COMPL'NT |
|-----------------|-----------------|---------|------------------|---------|------------------------|
|                 | WARRANT REQR'MT |         | Minimum Criteria |         |                        |
|                 | MAJOR           | MINR/PD | MAJOR            | MINR/PD |                        |
| Cond A          | 420             | 105     | 336              | 84      | 0                      |
| Cond B          | 630             | 53      | 504              | 42      | 3                      |
| Criteria 4-4Hr  | Variable        | 100     | Variable         | 80      | 0                      |
| Criteria 4-1 Hr | Variable        | 190     | Variable         | 162     | 0                      |

|                  |
|------------------|
| Part 4 Satisfied |
| With RTOR N      |
| Without RTOR N   |

|                 | NO RTOR Reduction |         | 80 %            |         | MAJOR & MINOR COMPL'NT |
|-----------------|-------------------|---------|-----------------|---------|------------------------|
|                 | WARRANT REQR'MT   |         | WARRANT REQR'MT |         |                        |
|                 | MAJOR             | MINR/PD | MAJOR           | MINR/PD |                        |
| Cond A          | 420               | 105     | 336             | 84      | 3                      |
| Cond B          | 630               | 53      | 504             | 42      | 7                      |
| Criteria 4-4Hr  | Variable          | 100     | Variable        | 80      | 0                      |
| Criteria 4-1 Hr | Variable          | 190     | Variable        | 162     | 0                      |

Crash Analysis for US 41 and Elkhorn Road  
 Date: 10/01/2013 - 09/30/2016

| <b>1.) SEVERITY</b>             | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016</b> | <b>TOTALS</b> |             |
|---------------------------------|-------------|-------------|-------------|-------------|---------------|-------------|
| Property Damage .....           | 0           | 0           | 0           | 1           | 1             | 14%         |
| Non-Incapacitating Injury ..... | 0           | 1           | 1           | 0           | 2             | 29%         |
| Incapacitating Injury .....     | 0           | 2           | 2           | 0           | 4             | 57%         |
| Fatality .....                  | 0           | 0           | 0           | 0           | 0             | 0%          |
|                                 |             |             |             |             | ---           |             |
| <b>TOTALS</b>                   | <b>0</b>    | <b>3</b>    | <b>3</b>    | <b>1</b>    | <b>7</b>      | <b>100%</b> |

| <b>2.) COLLISION DIAGRAM</b>            | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016</b> | <b>TOTALS</b> |             |
|-----------------------------------------|-------------|-------------|-------------|-------------|---------------|-------------|
| Rear End Collision (#1) .....           | 0           | 0           | 1           | 0           | 1             | 14%         |
| Head-On Collision (#2) .....            | 0           | 0           | 2           | 0           | 2             | 29%         |
| Same Direction Sideswipe (#3) .....     | 0           | 1           | 0           | 0           | 1             | 14%         |
| Opposite Direction Sideswipe (#4) ..... | 0           | 0           | 0           | 0           | 0             | 0%          |
| Off Road Collision (#5) .....           | 0           | 0           | 0           | 0           | 0             | 0%          |
| Right Angle Collision (#6).....         | 0           | 2           | 0           | 1           | 3             | 43%         |
| Lt. Turn Collision (#7-13).....         | 0           | 0           | 0           | 0           | 0             | 0%          |
| Rt. Turn Collision (#14-18).....        | 0           | 0           | 0           | 0           | 0             | 0%          |
| Animal/Object in Roadway .....          | 0           | 0           | 0           | 0           | 0             | 0%          |
| Backing Crash .....                     | 0           | 0           | 0           | 0           | 0             | 0%          |
| Rear to Rear .....                      | 0           | 0           | 0           | 0           | 0             | 0%          |
| Left/Right Turn .....                   | 0           | 0           | 0           | 0           | 0             | 0%          |
| Non-Collision .....                     | 0           | 0           | 0           | 0           | 0             | 0%          |
| Other .....                             | 0           | 0           | 0           | 0           | 0             | 0%          |
| Unknown.....                            | 0           | 0           | 0           | 0           | 0             | 0%          |
|                                         |             |             |             |             | ---           |             |
| <b>TOTALS</b>                           | <b>0</b>    | <b>3</b>    | <b>3</b>    | <b>1</b>    | <b>7</b>      | <b>100%</b> |

| <b>3.) SURFACE CONDITION</b>     | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016</b> | <b>TOTALS</b> |             |
|----------------------------------|-------------|-------------|-------------|-------------|---------------|-------------|
| Dry (#1).....                    | 0           | 3           | 3           | 0           | 6             | 86%         |
| Wet (#2).....                    | 0           | 0           | 0           | 1           | 1             | 14%         |
| Snow/Ice/Slush (#3,4,5).....     | 0           | 0           | 0           | 0           | 0             | 0%          |
| Loose Material .....             | 0           | 0           | 0           | 0           | 0             | 0%          |
| Muddy .....                      | 0           | 0           | 0           | 0           | 0             | 0%          |
| Water (Standing or Moving) ..... | 0           | 0           | 0           | 0           | 0             | 0%          |
| Other.....                       | 0           | 0           | 0           | 0           | 0             | 0%          |
| Unknown.....                     | 0           | 0           | 0           | 0           | 0             | 0%          |
|                                  |             |             |             |             | ---           |             |
| <b>TOTALS</b>                    | <b>0</b>    | <b>3</b>    | <b>3</b>    | <b>1</b>    | <b>7</b>      | <b>100%</b> |

| <b>4.) CONTRIBUTING CIRCUMSTANCE</b> | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016</b> | <b>TOTALS</b> |             |
|--------------------------------------|-------------|-------------|-------------|-------------|---------------|-------------|
| Unsafe Speed .....                   | 0           | 0           | 0           | 0           | 0             | 0%          |
| Disregard Signal/Sign .....          | 0           | 0           | 0           | 0           | 0             | 0%          |
| Failure to Yield R/W .....           | 1           | 2           | 2           | 1           | 6             | 67%         |
| Brake Failure or Defective .....     | 0           | 0           | 0           | 0           | 0             | 0%          |
| Following Too Closely .....          | 0           | 0           | 1           | 0           | 1             | 11%         |
| Animal/Object in Roadway .....       | 0           | 0           | 0           | 0           | 0             | 0%          |
| Road Condition .....                 | 0           | 0           | 0           | 0           | 0             | 0%          |
| Ran Off Road .....                   | 0           | 0           | 0           | 0           | 0             | 0%          |
| Improper Turning .....               | 0           | 0           | 0           | 1           | 1             | 11%         |
| Distracted .....                     | 0           | 0           | 0           | 0           | 0             | 0%          |
| Driver Illness or Fatigue .....      | 0           | 0           | 0           | 0           | 0             | 0%          |
| Illegal Drugs or Alcohol .....       | 0           | 0           | 0           | 0           | 0             | 0%          |
| Unsafe Lane Movement .....           | 0           | 1           | 0           | 0           | 1             | 11%         |
| Unknown/Other .....                  | 0           | 0           | 0           | 0           | 0             | 0%          |
|                                      |             |             |             |             | ---           |             |
| <b>TOTALS</b>                        | <b>1</b>    | <b>3</b>    | <b>3</b>    | <b>2</b>    | <b>9</b>      | <b>100%</b> |

| <b>5.) MONTH</b>    | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016</b> | <b>TOTALS</b> |             |
|---------------------|-------------|-------------|-------------|-------------|---------------|-------------|
| January (01).....   | 0           | 0           | 0           | 0           | 0             | 0%          |
| February (02) ..... | 0           | 0           | 0           | 0           | 0             | 0%          |
| March (03) .....    | 0           | 0           | 1           | 1           | 2             | 29%         |
| April (04).....     | 0           | 0           | 0           | 0           | 0             | 0%          |
| May (05).....       | 0           | 0           | 0           | 0           | 0             | 0%          |
| June (06).....      | 0           | 1           | 0           | 0           | 1             | 14%         |
| July (07).....      | 0           | 0           | 0           | 0           | 0             | 0%          |
| August (08).....    | 0           | 0           | 0           | 0           | 0             | 0%          |
| September (09)..... | 0           | 0           | 0           | 0           | 0             | 0%          |
| October (10).....   | 0           | 1           | 1           | 0           | 2             | 29%         |
| November (11).....  | 0           | 0           | 1           | 0           | 1             | 14%         |
| December (12).....  | 0           | 1           | 0           | 0           | 1             | 14%         |
| Unknown.....        | 0           | 0           | 0           | 0           | 0             | 0%          |
|                     |             |             |             |             | ---           |             |
| <b>TOTALS</b>       | <b>0</b>    | <b>3</b>    | <b>3</b>    | <b>1</b>    | <b>7</b>      | <b>100%</b> |

| <b>6.) DAY OF WEEK</b> | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016</b> | <b>TOTALS</b> |             |
|------------------------|-------------|-------------|-------------|-------------|---------------|-------------|
| Sunday.....            | 0           | 0           | 0           | 0           | 0             | 0%          |
| Monday.....            | 0           | 1           | 1           | 0           | 2             | 29%         |
| Tuesday.....           | 0           | 0           | 1           | 0           | 1             | 14%         |
| Wednesday.....         | 0           | 1           | 0           | 0           | 1             | 14%         |
| Thursday.....          | 0           | 1           | 1           | 1           | 3             | 43%         |
| Friday.....            | 0           | 0           | 0           | 0           | 0             | 0%          |
| Saturday.....          | 0           | 0           | 0           | 0           | 0             | 0%          |
| Unknown.....           | 0           | 0           | 0           | 0           | 0             | 0%          |
|                        |             |             |             |             | ---           |             |
| <b>TOTALS</b>          | <b>0</b>    | <b>3</b>    | <b>3</b>    | <b>1</b>    | <b>7</b>      | <b>100%</b> |

7.) *HOUR OF*

| <i>DAY</i>                  | 2013     | 2014     | 2015     | 2016     | <i>TOTALS</i> |             |
|-----------------------------|----------|----------|----------|----------|---------------|-------------|
| 6-7AM (0600).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 7-8AM (0700).....           | 0        | 1        | 1        | 0        | 2             | 29%         |
| 8-9AM (0800).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 9-10AM (0900).....          | 0        | 0        | 0        | 0        | 0             | 0%          |
| 10-11AM (1000).....         | 0        | 0        | 0        | 0        | 0             | 0%          |
| 11A-12N (1100).....         | 0        | 1        | 1        | 0        | 2             | 29%         |
| 12N-1P (1200).....          | 0        | 0        | 0        | 1        | 1             | 14%         |
| 1-2PM (1300).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 2-3PM (1400).....           | 0        | 1        | 0        | 0        | 1             | 14%         |
| 3-4PM (1500).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 4-5PM (1600).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 5-6PM (1700).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
|                             |          |          |          |          | ---           |             |
| <b>Daylight Sub-Totals</b>  | <b>0</b> | <b>3</b> | <b>2</b> | <b>1</b> | <b>6</b>      | <b>86%</b>  |
| 6-7PM (1800).....           | 0        | 0        | 1        | 0        | 1             | 14%         |
| 7-8PM (1900).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 8-9PM (2000).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 9-10PM (2100).....          | 0        | 0        | 0        | 0        | 0             | 0%          |
| 10-11PM (2200).....         | 0        | 0        | 0        | 0        | 0             | 0%          |
| 11P-12M (2300).....         | 0        | 0        | 0        | 0        | 0             | 0%          |
| 12M-1A (2400).....          | 0        | 0        | 0        | 0        | 0             | 0%          |
| 1-2AM (0100).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 2-3AM (0200).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 3-4AM (0300).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 4-5AM (0400).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| 5-6AM (0500).....           | 0        | 0        | 0        | 0        | 0             | 0%          |
| Unknown.....                | 0        | 0        | 0        | 0        | 0             | 0%          |
|                             |          |          |          |          | ---           |             |
| <b>Nighttime Sub-Totals</b> | <b>0</b> | <b>0</b> | <b>1</b> | <b>0</b> | <b>1</b>      | <b>14%</b>  |
|                             |          |          |          |          | ---           |             |
| <b>GRAND TOTALS</b>         | <b>0</b> | <b>3</b> | <b>3</b> | <b>1</b> | <b>7</b>      | <b>100%</b> |

| <b>8.) ROAD CHARACTER</b>     | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016</b> | <b>TOTALS</b> |             |
|-------------------------------|-------------|-------------|-------------|-------------|---------------|-------------|
| Straight/Level (#1).....      | 0           | 3           | 3           | 1           | 7             | 100%        |
| Straight/Grade (#2).....      | 0           | 0           | 0           | 0           | 0             | 0%          |
| Straight/Hillcrest (#3) ..... | 0           | 0           | 0           | 0           | 0             | 0%          |
| Curve/Level (#4).....         | 0           | 0           | 0           | 0           | 0             | 0%          |
| Curve/Grade (#5).....         | 0           | 0           | 0           | 0           | 0             | 0%          |
| Curve/Hillcrest (#6).....     | 0           | 0           | 0           | 0           | 0             | 0%          |
| Unknown.....                  | 0           | 0           | 0           | 0           | 0             | 0%          |
|                               |             |             |             |             | ---           |             |
| <b>TOTALS</b>                 | <b>0</b>    | <b>3</b>    | <b>3</b>    | <b>1</b>    | <b>7</b>      | <b>100%</b> |

| Traffic Volumes For Each Approach With NO RTOR Reduction |                      |       |      |                      |       |      |                     |      |       |                     |      |       |
|----------------------------------------------------------|----------------------|-------|------|----------------------|-------|------|---------------------|------|-------|---------------------|------|-------|
| Hour Beginning                                           | From The North Going |       |      | From The South Going |       |      | From The East Going |      |       | From The West Going |      |       |
|                                                          | West                 | South | East | East                 | North | West | North               | West | South | South               | East | North |
| 6.00                                                     | 3                    | 472   | 109  | 12                   | 313   | 0    | 48                  | 4    | 7     | 2                   | 3    | 2     |
| 7.00                                                     | 8                    | 489   | 160  | 19                   | 410   | 0    | 82                  | 5    | 12    | 5                   | 10   | 2     |
| 8.00                                                     | 3                    | 336   | 16   | 13                   | 339   | 3    | 17                  | 8    | 11    | 1                   | 4    | 6     |
| 9.00                                                     | 6                    | 347   | 20   | 10                   | 313   | 1    | 10                  | 1    | 5     | 0                   | 4    | 3     |
| 10.00                                                    | 6                    | 346   | 31   | 9                    | 362   | 2    | 16                  | 3    | 8     | 1                   | 7    | 4     |
| 11.00                                                    | 8                    | 345   | 49   | 10                   | 326   | 3    | 66                  | 6    | 7     | 3                   | 6    | 3     |
| 12.00                                                    | 4                    | 354   | 47   | 9                    | 351   | 0    | 28                  | 8    | 11    | 1                   | 4    | 4     |
| 13.00                                                    | 0                    | 406   | 28   | 15                   | 387   | 0    | 18                  | 4    | 10    | 1                   | 3    | 4     |
| 14.00                                                    | 5                    | 425   | 17   | 20                   | 393   | 5    | 24                  | 6    | 7     | 2                   | 12   | 4     |
| 15.00                                                    | 5                    | 446   | 16   | 15                   | 405   | 1    | 17                  | 10   | 20    | 1                   | 4    | 4     |
| 16.00                                                    | 6                    | 443   | 16   | 25                   | 462   | 2    | 61                  | 11   | 15    | 6                   | 6    | 7     |
| 17.00                                                    | 11                   | 478   | 15   | 20                   | 630   | 3    | 59                  | 18   | 14    | 2                   | 7    | 6     |
| 18.00                                                    | 0                    | 0     | 0    | 0                    | 0     | 0    | 0                   | 0    | 0     | 0                   | 0    | 0     |
| 19.00                                                    | 0                    | 0     | 0    | 0                    | 0     | 0    | 0                   | 0    | 0     | 0                   | 0    | 0     |
| 20.00                                                    | 0                    | 0     | 0    | 0                    | 0     | 0    | 0                   | 0    | 0     | 0                   | 0    | 0     |
| 21.00                                                    | 0                    | 0     | 0    | 0                    | 0     | 0    | 0                   | 0    | 0     | 0                   | 0    | 0     |

| SUMMARY OF TRAFFIC COUNTS Major Plus Both Minor Approaches |                             |                             |             |                            |                             |                             |
|------------------------------------------------------------|-----------------------------|-----------------------------|-------------|----------------------------|-----------------------------|-----------------------------|
| NO RTOR REDUCTION                                          |                             |                             |             | WITH RTOR REDUCTION        |                             |                             |
| Major Route Both N & S App                                 | Minor Route East App Volume | Minor Route West App Volume | Time of Day | Major Route Both N & S App | Minor Route East App Volume | Minor Route West App Volume |
| 909                                                        | 59                          | 7                           | 6.00        | 905                        | 22                          | 7                           |
| 1086                                                       | 99                          | 17                          | 7.00        | 1079                       | 54                          | 17                          |
| 710                                                        | 36                          | 11                          | 8.00        | 706                        | 23                          | 11                          |
| 697                                                        | 16                          | 7                           | 9.00        | 694                        | 8                           | 7                           |
| 756                                                        | 27                          | 12                          | 10.00       | 753                        | 15                          | 12                          |
| 741                                                        | 79                          | 12                          | 11.00       | 735                        | 34                          | 12                          |
| 765                                                        | 47                          | 9                           | 12.00       | 762                        | 26                          | 9                           |
| 836                                                        | 32                          | 8                           | 13.00       | 833                        | 18                          | 8                           |
| 865                                                        | 37                          | 18                          | 14.00       | 859                        | 19                          | 18                          |
| 888                                                        | 47                          | 9                           | 15.00       | 884                        | 34                          | 9                           |
| 954                                                        | 87                          | 19                          | 16.00       | 944                        | 44                          | 19                          |
| 1157                                                       | 91                          | 15                          | 17.00       | 1149                       | 47                          | 15                          |
| 0                                                          | 0                           | 0                           | 18.00       | 0                          | 0                           | 0                           |
| 0                                                          | 0                           | 0                           | 19.00       | 0                          | 0                           | 0                           |
| 0                                                          | 0                           | 0                           | 20.00       | 0                          | 0                           | 0                           |
| 0                                                          | 0                           | 0                           | 21.00       | 0                          | 0                           | 0                           |



May 14, 2020

TO: Troy Arnold  
INDOT Project Manager, Vincennes District

FROM: Josh Cook, PE  
HNTB Project Manager

SUBJECT: Technical Memorandum  
Intersection Improvement Concepts Evaluation  
Des. No.: 1800224  
US 41 at Elkhorn Road Intersection Improvement

Transmitted, herewith, is the discussion of two alternative concepts for the intersection improvement at US 41 at Elkhorn Road. The enclosed memo was developed to present the results of evaluating a traditional reduced conflict intersection and a partial reduced conflict intersection.

If you have any questions or require additional information, please contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Josh Cook".

Josh Cook, P.E.

cc: File

## **Intersection Improvement Concepts Evaluation**

### **PROJECT HISTORY**

The intersection at US 41 and Elkhorn Road South of Vincennes, Indiana was identified for an intersection improvement project. The original project scope was to reduce crashes by constructing a reduced conflict intersection (RCI). Before proceeding into design, two alternatives are to be evaluated including a traditional RCI and a partial RCI.

### **EXISTING CONDITIONS**

The US 41 corridor is a 4-lane divided highway with a mix of interchanges and at-grade intersections that carries 12,000 vehicles per day. It is not anticipated that “through traffic” on US 41 will increase. The traffic on Elkhorn Road east of the intersection is 2,000 vehicles per day and there are plans for an industrial park. Trips to and from the industrial park were estimated using the latest version of the ITE Trip Generation Manual and included in project forecasts. The traffic volume on Elkhorn west of US 41 is 1,000 vehicles per day and an increase in traffic is not anticipated. US 41 crosses Mantle Ditch located 600 feet south of the intersection. The US 41 bridges currently accommodates 2 lanes of traffic.

Crash data provided by INDOT for 2017 to 2019 was evaluated. There were 15 crashes near the intersection at US 41 and Elkhorn Road over the 3-year period. Of those 15 crashes, 9 of them were due to failure to yield right of way. A majority of the crashes are “right angle” or “left turn” crashes involving high speed vehicles on US 41. The identified need/project intent is to reduce the number of crashes at the intersection.

### **CONCEPTS**

Constructing a traditional RCI places the median u-turns 800 feet from the main intersection. This requires widening of the US 41 bridges over Mantle Ditch. The southbound US 41 bridge needs to be widened towards the median to accommodate the auxiliary lane approaching the southbound u-turn. The US 41 northbound bridge needs to be widened to the median to provide appropriate deceleration for the northbound left turn and widened to the east to extend the right-turn back to receive the u-turn traffic and provide deceleration distance.

The partial RCI would not have a median u-turn for southbound US 41 or a northbound left turn lane, thus eliminating the need to widen the bridges over Mantle Ditch. The traffic that would utilize the eliminated movements is low and could easily be re-routed to the interchange at Business US 41/Decker Road north of Elkhorn Road or to Old US 41 to the south. The northbound right turn lane length would be reduced to avoid widening the bridge for the full deceleration length.

## CONCLUSION

The cost difference between a traditional and partial RCI is \$2.6 million at this location. The traditional and partial RCI both meet the project need to reduce crashes.

Sincerely,

A handwritten signature in black ink, appearing to read "Josh Cook". The signature is fluid and cursive, with the first letter of each word being capitalized and prominent.

Josh Cook, P.E.

## ATTACHMENTS

- A. Traffic Forecast Report & Trip Generation Calculations
- B. Crash Analysis
- C. Traffic Analysis
- D. RCI Concept Layouts and Cost Estimates

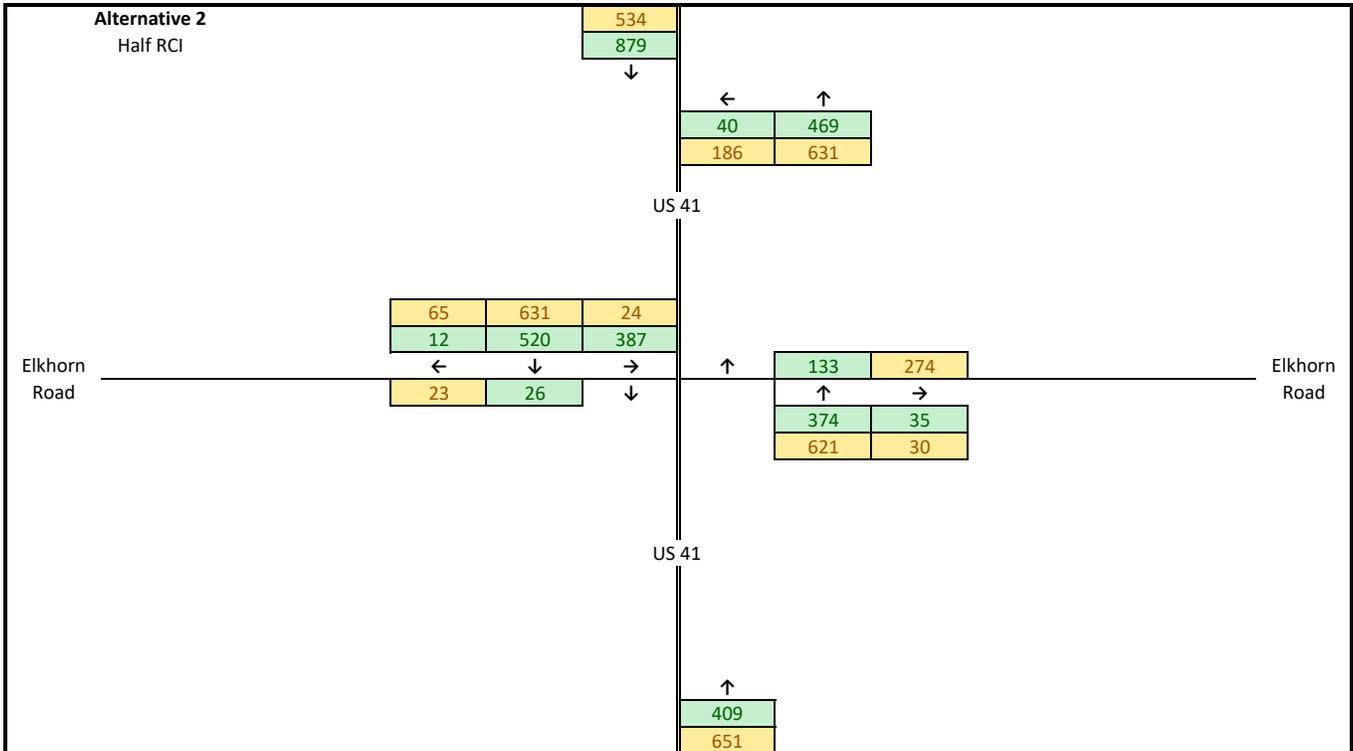
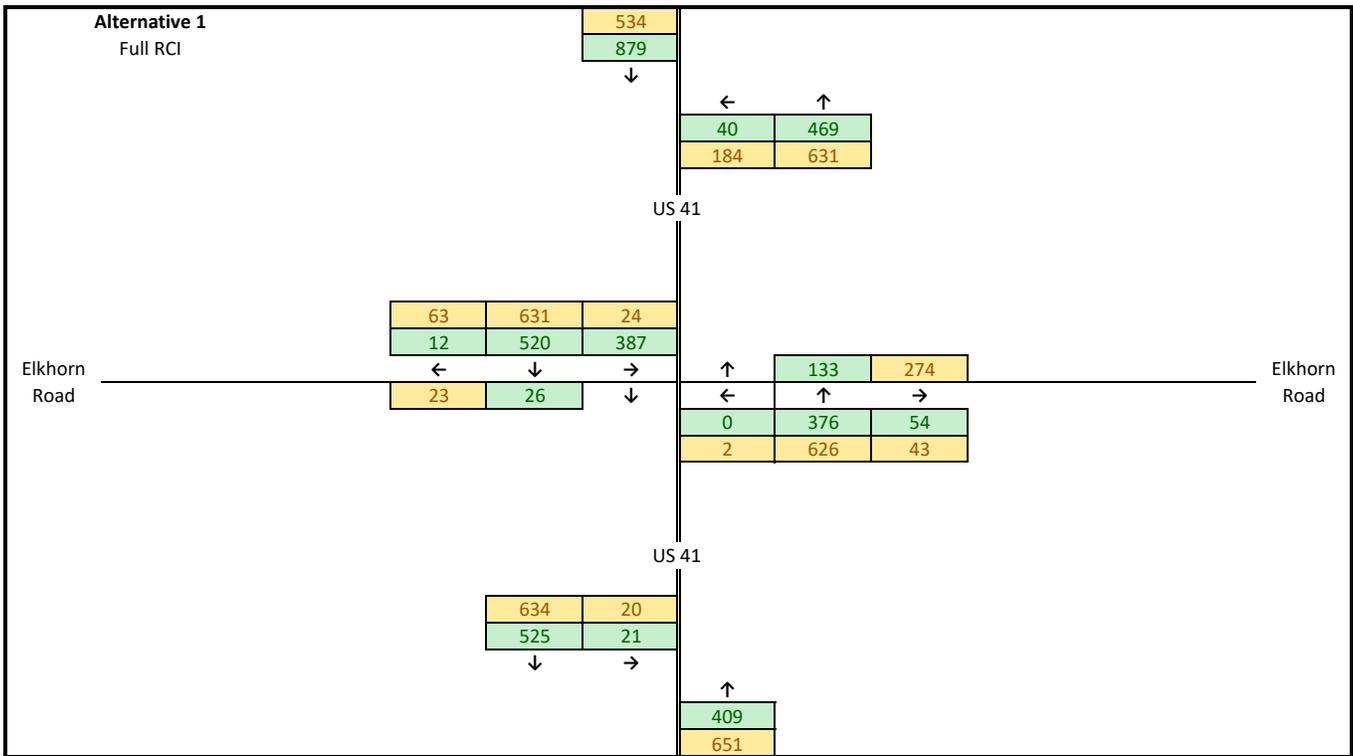
# Attachment A

## US 41 at Elkhorn Road Existing Forecast

Existing Turning Movement

|              |  |       |     |     |              |     |    |
|--------------|--|-------|-----|-----|--------------|-----|----|
|              |  | US 41 |     |     |              |     |    |
|              |  | 525   |     | 685 |              |     |    |
|              |  | 693   |     | 467 |              |     |    |
| Elkhorn Road |  | 10    | 500 | 15  | ↑            | 91  | 59 |
|              |  | 7     | 485 | 201 | ←            | 4   | 18 |
|              |  | ←     | ↓   | →   | ↓            | 8   | 16 |
|              |  | 7     | 2   | ↑   | ←            | ↑   | →  |
|              |  | 8     | 10  | →   | 0            | 374 | 18 |
|              |  | 3     | 5   | ↓   | 2            | 619 | 19 |
|              |  | 498   |     | 392 |              |     |    |
|              |  | 519   |     | 640 |              |     |    |
|              |  | US 41 |     |     |              |     |    |
|              |  |       |     |     | Elkhorn Road |     |    |

US 41 at Elkhorn Road  
Existing Forecast + Development



US 41 at Elkhorn Road  
Trip Generation Calculations

| Lot                | Land Use Classification  | Site Area | Building Area | Area per 1000 sq.ft. | AM Peak Trips Entering | AM Peak Trips Exiting | PM Peak Trips Entering | PM Peak Trips Exiting | Daily Trips  |
|--------------------|--------------------------|-----------|---------------|----------------------|------------------------|-----------------------|------------------------|-----------------------|--------------|
| 1                  | General Light Industrial | 100,700   | 30,210        | 30                   | 16                     | 2                     | 2                      | 14                    | 172          |
| 2                  | General Light Industrial | 114,000   | 34,200        | 34                   | 18                     | 2                     | 2                      | 15                    | 187          |
| 3                  | General Light Industrial | 124,000   | 37,200        | 37                   | 19                     | 3                     | 2                      | 16                    | 198          |
| 4                  | General Light Industrial | 122,700   | 36,810        | 37                   | 19                     | 3                     | 2                      | 16                    | 198          |
| 5                  | General Light Industrial | 131,700   | 39,510        | 40                   | 20                     | 3                     | 3                      | 17                    | 210          |
| 6                  | General Light Industrial | 122,500   | 36,750        | 37                   | 19                     | 3                     | 2                      | 16                    | 198          |
| 7                  | General Light Industrial | 114,000   | 34,200        | 34                   | 18                     | 2                     | 2                      | 15                    | 187          |
| 8                  | General Light Industrial | 95,500    | 28,650        | 29                   | 16                     | 2                     | 2                      | 14                    | 168          |
| 9                  | General Light Industrial | 93,700    | 28,110        | 28                   | 15                     | 2                     | 2                      | 13                    | 164          |
| 10                 | General Light Industrial | 124,000   | 37,200        | 37                   | 19                     | 3                     | 2                      | 16                    | 198          |
| 11                 | General Light Industrial | 123,000   | 36,900        | 37                   | 19                     | 3                     | 2                      | 16                    | 198          |
| 12                 | General Light Industrial | 86,800    | 26,040        | 26                   | 14                     | 2                     | 2                      | 13                    | 157          |
| <b>Total Trips</b> |                          |           |               |                      | <b>212</b>             | <b>30</b>             | <b>25</b>              | <b>181</b>            | <b>2,235</b> |

**Assumptions**

- 30% of each site is covered by building
- site information was provided by INDOT
- land use at each site was assumed general light industrial



**PROJECT TRAFFIC FORECAST REPORT**

**DES No.:** 1800224

US-41 At Elkhorn Road, South of Vincennes

From RP 51+5 to RP 51+35

Knox County

**Prepared For**

Troy Arnold

**On**

03/03/2020

**By**

INDOT, Office of Traffic Statistics  
Technical Planning Support & Programming Division  
Gregory A. Katter, PE, Supervisor  
100 N. Senate Ave, N955  
Indianapolis, Indiana 46204  
[INDOTTrafficForecasts@indot.IN.gov](mailto:INDOTTrafficForecasts@indot.IN.gov)



**PROJECT TRAFFIC FORECAST REPORT**

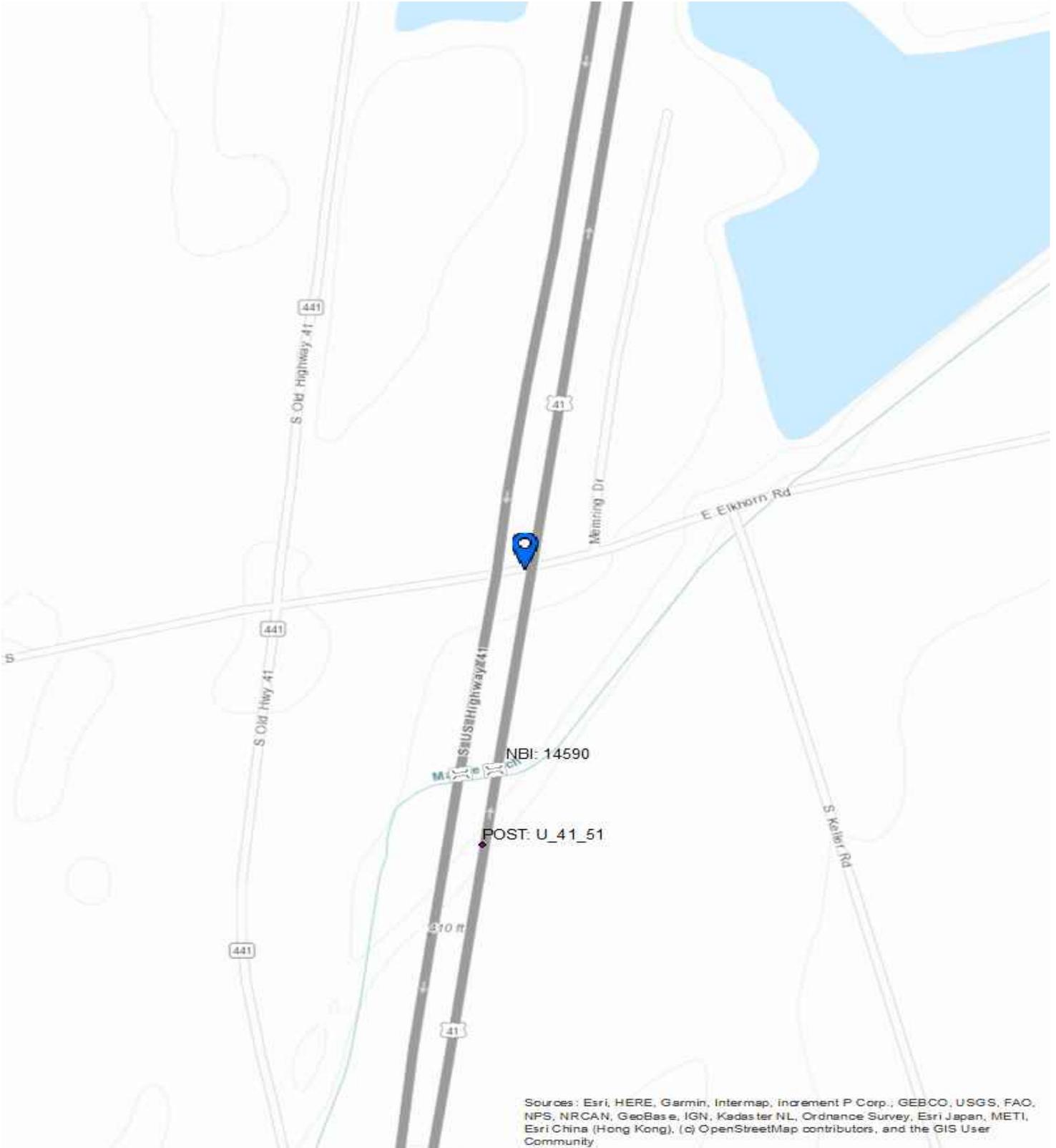
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Project Map

Intersection 1 Forecast



PROJECT TRAFFIC FORECAST REPORT





PROJECT TRAFFIC FORECAST REPORT

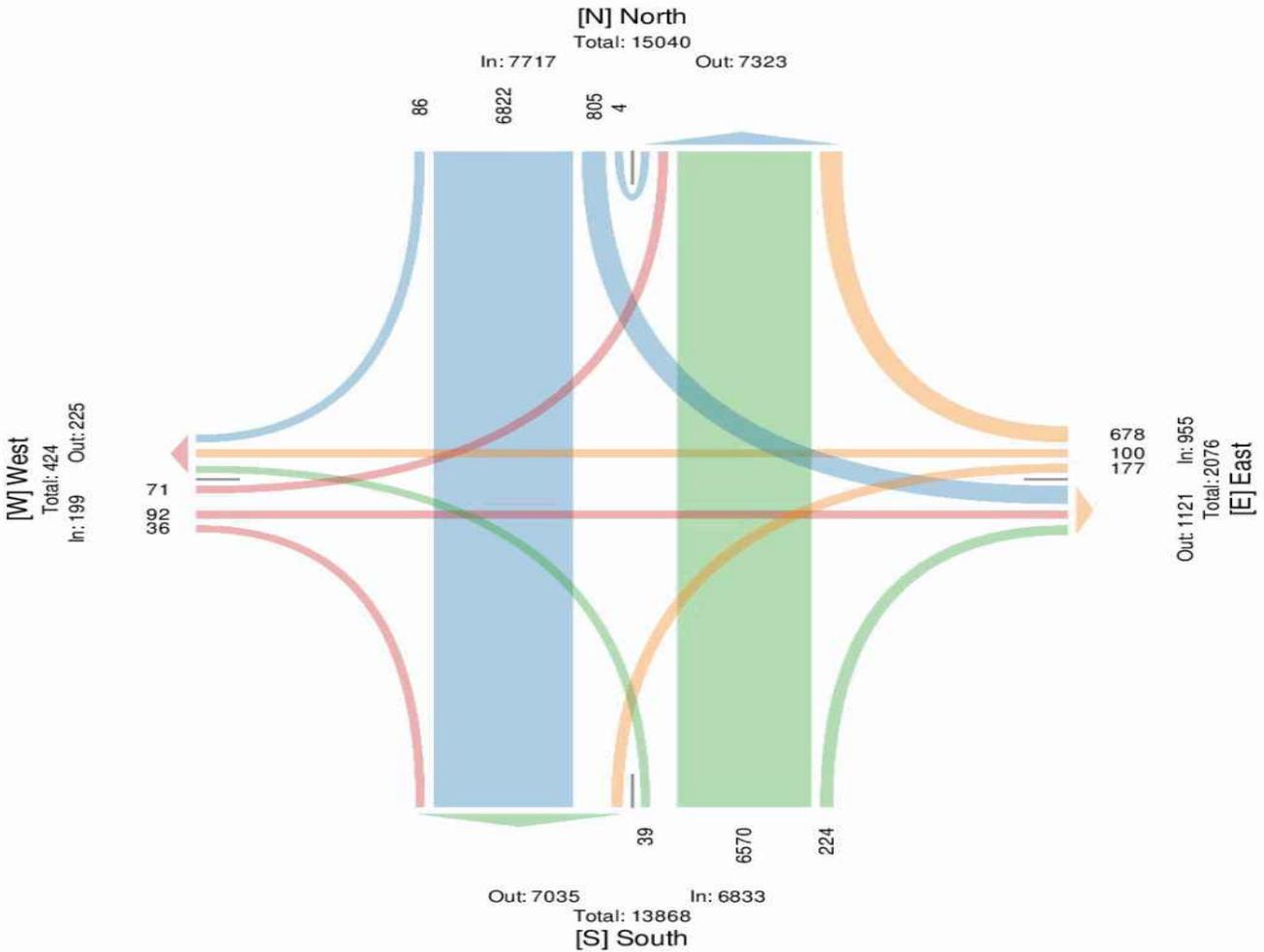
Intersection: 1

VD\_US41 @ Elkhorn Rd - TMC

Thu Oct 26, 2017
Full Length (9 AM-9 AM (+1))
All Classes (Motorcycles, Cars, Light Goods Vehicles, Single-Unit Trucks, Articulated Trucks, Buses)
All Movements
ID: 463540, Location: 38.63318, -87.531574



Provided by: Indiana DOT
100 N. Senate Ave.,
Indianapolis, IN, 46204, US





**PROJECT TRAFFIC FORECAST REPORT**

**Location:** At Elkhorn Road, South of Vincennes

The table below contains the projected Annual Average Daily Traffic (AADT) in each requested year for each approach and movement.

The per year growth rate used for each approach is indicated in the table below. It is applied as a straight line growth.

For the purpose of this report a commercial vehicle would fall into FHWA Scheme F Classes 4 through 13. They are identified by MioVision as either an Articulated Truck, a Bus, or a Single-Unit Truck.

| Daily Movement Forecast |                    |          |       |                 |             |                             |                               |                               |                       |                       |
|-------------------------|--------------------|----------|-------|-----------------|-------------|-----------------------------|-------------------------------|-------------------------------|-----------------------|-----------------------|
| Approach Road Name      | Approach Direction | Movement | Total | Count Year AADT | Growth Rate | Construction Year AADT 2023 | Intermediate Year 1 AADT 2033 | Intermediate Year 2 AADT 2038 | Design Year AADT 2043 | Commercial Percentage |
| ELKHORN RD              | East               | Right    | 678   | 628             | 0.00%       | 628                         | 628                           | 628                           | 628                   | 7.23%                 |
| ELKHORN RD              | East               | Thru     | 100   | 93              | 0.00%       | 93                          | 93                            | 93                            | 93                    | 11.00%                |
| ELKHORN RD              | East               | Left     | 177   | 164             | 0.00%       | 164                         | 164                           | 164                           | 164                   | 19.21%                |
| ELKHORN RD              | East               | U-Turn   | 0     | 0               | 0.00%       | 0                           | 0                             | 0                             | 0                     | 0.00%                 |
| ELKHORN RD              | East               | Total    | 955   | 884             | 0.00%       | 884                         | 884                           | 884                           | 884                   | 0.00%                 |
| US 41                   | North              | Right    | 86    | 77              | 0.00%       | 77                          | 77                            | 77                            | 77                    | 9.30%                 |
| US 41                   | North              | Thru     | 6,822 | 6,140           | 0.00%       | 6,140                       | 6,140                         | 6,140                         | 6,140                 | 21.59%                |
| US 41                   | North              | Left     | 805   | 725             | 0.00%       | 724                         | 724                           | 724                           | 724                   | 7.83%                 |
| US 41                   | North              | U-Turn   | 4     | 4               | 0.00%       | 4                           | 4                             | 4                             | 4                     | 0.00%                 |
| US 41                   | North              | Total    | 7,717 | 6,945           | 0.00%       | 6,945                       | 6,945                         | 6,945                         | 6,945                 | 0.00%                 |
| US 41 SB                | South              | Right    | 224   | 207             | 0.00%       | 207                         | 207                           | 207                           | 207                   | 22.77%                |
| US 41 SB                | South              | Thru     | 6,570 | 6,084           | 0.00%       | 6,084                       | 6,084                         | 6,084                         | 6,084                 | 21.74%                |
| US 41 SB                | South              | Left     | 39    | 36              | 0.00%       | 36                          | 36                            | 36                            | 36                    | 12.82%                |
| US 41 SB                | South              | U-Turn   | 0     | 0               | 0.00%       | 0                           | 0                             | 0                             | 0                     | 0.00%                 |
| US 41 SB                | South              | Total    | 6,833 | 6,327           | 0.00%       | 6,327                       | 6,327                         | 6,327                         | 6,327                 | 0.00%                 |
| ELKHORN RD              | West               | Right    | 36    | 32              | 0.00%       | 32                          | 32                            | 32                            | 32                    | 5.56%                 |
| ELKHORN RD              | West               | Thru     | 92    | 83              | 0.00%       | 83                          | 83                            | 83                            | 83                    | 8.70%                 |
| ELKHORN RD              | West               | Left     | 71    | 64              | 0.00%       | 64                          | 64                            | 64                            | 64                    | 8.45%                 |
| ELKHORN RD              | West               | U-Turn   | 0     | 0               | 0.00%       | 0                           | 0                             | 0                             | 0                     | 0.00%                 |
| ELKHORN RD              | West               | Total    | 199   | 179             | 0.00%       | 179                         | 179                           | 179                           | 179                   | 0.00%                 |

**Growth Rate Notes**



**PROJECT TRAFFIC FORECAST REPORT**

**Location:** At Elkhorn Road, South of Vincennes

The table below contains the projected traffic volumes in each requested year for approach and movement during the morning and afternoon peak hour.

The morning and afternoon peak hours are those 60 minute periods during which the most vehicles pass through the intersection.

| AM PM Peak Movement Forecast |             |          |          |                |                   |                 |                             |                               |                               |                       |
|------------------------------|-------------|----------|----------|----------------|-------------------|-----------------|-----------------------------|-------------------------------|-------------------------------|-----------------------|
| Approach Direction           | Growth Rate | Movement | Interval | Total Vehicles | Commercial % AADT | Count Year AADT | Construction Year AADT 2023 | Intermediate Year 1 AADT 2033 | Intermediate Year 2 AADT 2038 | Design Year AADT 2043 |
| East                         | 0.00%       | Left     | 6:45 AM  | 8              | 37.50%            | 7               | 7                           | 7                             | 7                             | 7                     |
| East                         | 0.00%       | Thru     | 6:45 AM  | 4              | 0.00%             | 4               | 4                           | 4                             | 4                             | 4                     |
| East                         | 0.00%       | Right    | 6:45 AM  | 91             | 0.00%             | 84              | 84                          | 84                            | 84                            | 84                    |
| East                         | 0.00%       | U-Turn   | 6:45 AM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |
| North                        | 0.00%       | Left     | 6:45 AM  | 201            | 2.49%             | 181             | 181                         | 181                           | 181                           | 181                   |
| North                        | 0.00%       | Thru     | 6:45 AM  | 485            | 16.08%            | 437             | 436                         | 436                           | 436                           | 436                   |
| North                        | 0.00%       | Right    | 6:45 AM  | 7              | 0.00%             | 6               | 6                           | 6                             | 6                             | 6                     |
| North                        | 0.00%       | U-Turn   | 6:45 AM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |
| South                        | 0.00%       | Left     | 6:45 AM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |
| South                        | 0.00%       | Thru     | 6:45 AM  | 374            | 12.30%            | 346             | 346                         | 346                           | 346                           | 346                   |
| South                        | 0.00%       | Right    | 6:45 AM  | 18             | 5.56%             | 17              | 17                          | 17                            | 17                            | 17                    |
| South                        | 0.00%       | U-Turn   | 6:45 AM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |
| West                         | 0.00%       | Left     | 6:45 AM  | 2              | 0.00%             | 2               | 2                           | 2                             | 2                             | 2                     |
| West                         | 0.00%       | Thru     | 6:45 AM  | 10             | 0.00%             | 9               | 9                           | 9                             | 9                             | 9                     |
| West                         | 0.00%       | Right    | 6:45 AM  | 5              | 0.00%             | 5               | 4                           | 4                             | 4                             | 4                     |
| West                         | 0.00%       | U-Turn   | 6:45 AM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |
| East                         | 0.00%       | Left     | 4:45 PM  | 16             | 12.50%            | 15              | 15                          | 15                            | 15                            | 15                    |
| East                         | 0.00%       | Thru     | 4:45 PM  | 18             | 0.00%             | 17              | 17                          | 17                            | 17                            | 17                    |
| East                         | 0.00%       | Right    | 4:45 PM  | 59             | 5.09%             | 55              | 55                          | 55                            | 55                            | 55                    |
| East                         | 0.00%       | U-Turn   | 4:45 PM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |
| North                        | 0.00%       | Left     | 4:45 PM  | 15             | 13.33%            | 14              | 14                          | 14                            | 14                            | 14                    |
| North                        | 0.00%       | Thru     | 4:45 PM  | 500            | 15.00%            | 450             | 450                         | 450                           | 450                           | 450                   |
| North                        | 0.00%       | Right    | 4:45 PM  | 10             | 20.00%            | 9               | 9                           | 9                             | 9                             | 9                     |
| North                        | 0.00%       | U-Turn   | 4:45 PM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |
| South                        | 0.00%       | Left     | 4:45 PM  | 2              | 0.00%             | 2               | 2                           | 2                             | 2                             | 2                     |
| South                        | 0.00%       | Thru     | 4:45 PM  | 619            | 11.96%            | 573             | 573                         | 573                           | 573                           | 573                   |
| South                        | 0.00%       | Right    | 4:45 PM  | 19             | 10.53%            | 18              | 18                          | 18                            | 18                            | 18                    |
| South                        | 0.00%       | U-Turn   | 4:45 PM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |
| West                         | 0.00%       | Left     | 4:45 PM  | 7              | 0.00%             | 6               | 6                           | 6                             | 6                             | 6                     |
| West                         | 0.00%       | Thru     | 4:45 PM  | 8              | 0.00%             | 7               | 7                           | 7                             | 7                             | 7                     |
| West                         | 0.00%       | Right    | 4:45 PM  | 3              | 0.00%             | 3               | 3                           | 3                             | 3                             | 3                     |
| West                         | 0.00%       | U-Turn   | 4:45 PM  | 0              | 0.00%             | 0               | 0                           | 0                             | 0                             | 0                     |

It should be recognized by users of this forecast that the base year AADT has an accuracy of plus or minus 10%. It should also be understood that while this report may include forecasts with up to six apparent significant figures, the accuracy should not be interpreted as being greater than two significant figures. It is the responsibility of designers to exercise professional judgement when using this data to influence decisions.

| Manner of Collision           | Fatal    | Injury   | PDO      | Grand Total |
|-------------------------------|----------|----------|----------|-------------|
| COLLISION WITH DEER           | 0        | 0        | 1        | 1           |
| COLLISION WITH OBJECT IN ROAD | 0        | 0        | 1        | 1           |
| LEFT TURN                     | 0        | 1        | 1        | 2           |
| LEFT/RIGHT TURN               | 0        | 1        | 0        | 1           |
| OPPOSITE DIRECTION SIDESWIPE  | 0        | 0        | 1        | 1           |
| OTHER - EXPLAIN IN NARRATIVE  | 0        | 1        | 0        | 1           |
| RAN OFF ROAD                  | 0        | 0        | 2        | 2           |
| REAR END                      | 0        | 1        | 0        | 1           |
| RIGHT ANGLE                   | 0        | 2        | 1        | 3           |
| RIGHT TURN                    | 0        | 0        | 1        | 1           |
| SAME DIRECTION SIDESWIPE      | 0        | 0        | 1        | 1           |
| <b>Total</b>                  | <b>0</b> | <b>6</b> | <b>9</b> | <b>15</b>   |

| Primary Factor of Collision            | Fatal    | Injury   | PDO      | Grand Total |
|----------------------------------------|----------|----------|----------|-------------|
| ANIMAL/OBJECT IN ROADWAY               | 0        | 0        | 2        | 2           |
| FAILURE TO YIELD RIGHT OF WAY          | 0        | 5        | 3        | 8           |
| FOLLOWING TOO CLOSELY                  | 0        | 0        | 0        | 0           |
| HEADLIGHT DEFECTIVE OR NOT ON          | 0        | 0        | 0        | 0           |
| IMPROPER LANE USAGE                    | 0        | 0        | 1        | 1           |
| IMPROPER TURNING                       | 0        | 1        | 0        | 1           |
| OTHER (VEHICLE) - EXPLAIN IN NARRATIVE | 0        | 0        | 1        | 1           |
| RAN OFF ROAD RIGHT                     | 0        | 0        | 1        | 1           |
| UNSAFE SPEED                           | 0        | 0        | 1        | 1           |
| <b>Total</b>                           | <b>0</b> | <b>6</b> | <b>9</b> | <b>15</b>   |

| Years<br>(Collision Date) | Fatal    | Injury   | PDO      | Grand Total |
|---------------------------|----------|----------|----------|-------------|
| 2016                      | 0        | 2        | 0        | 2           |
| 2017                      | 0        | 2        | 4        | 6           |
| 2018                      | 0        | 2        | 3        | 5           |
| 2019                      | 0        | 0        | 2        | 2           |
| <b>Total</b>              | <b>0</b> | <b>6</b> | <b>9</b> | <b>15</b>   |

| Weather Conditions | Fatal    | Injury   | PDO      | Grand Total |
|--------------------|----------|----------|----------|-------------|
| CLEAR              | 0        | 5        | 6        | 11          |
| RAIN               | 0        | 1        | 1        | 2           |
| CLOUDY             | 0        | 0        | 1        | 1           |
| SNOW               | 0        | 0        | 1        | 1           |
| <b>Total</b>       | <b>0</b> | <b>6</b> | <b>9</b> | <b>15</b>   |

US 41 at Elkhorn Road Crash Analysis Summary

| Surface Conditions | Fatal    | Injury   | PDO      | Grand Total |
|--------------------|----------|----------|----------|-------------|
| DRY                | 0        | 5        | 7        | 12          |
| ICE                | 0        | 0        | 0        | 0           |
| WET                | 0        | 1        | 2        | 3           |
| <b>Total</b>       | <b>0</b> | <b>6</b> | <b>9</b> | <b>15</b>   |

| Count of Trailers Involved | Fatal    | Injury   | PDO      | Grand Total |
|----------------------------|----------|----------|----------|-------------|
| Yes                        | 0        | 2        | 4        | 6           |
| No                         | 0        | 4        | 5        | 9           |
| <b>Total</b>               | <b>0</b> | <b>6</b> | <b>9</b> | <b>15</b>   |

# Attachment C

## Traffic Analysis Summary US 41 at Elkhorn Road

| Scenario               | Control      | EB Elkhorn Road | WB Elkhorn road | NB US 41 at SB U-Turn | SB US 41 at SB U-Turn | NB US 41 at NB U-Turn | SB US 41 at NB U-Turn |
|------------------------|--------------|-----------------|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 2019 Existing          | Unsignalized | D/D             | B/C             | -/-                   | -/-                   | -/-                   | -/-                   |
| 2043 RCI Alternative 1 | Unsignalized | B/B             | B/C             | -/-*                  | -/-*                  | -/-*                  | -/-*                  |
| 2043 RCI Alternative 2 | Unsignalized | B/B             | B/B             | -/-                   | -/-                   | -/-*                  | -/-*                  |

\* Unsignalized u-turn cannot be analyzed using HCM methodologies.

| Scenario                        | Travel Distance (miles) | Travel Time (hours) |
|---------------------------------|-------------------------|---------------------|
| 2019 Existing - AM Peak         | 90                      | 1.9                 |
| 2019 Existing - PM Peak         | 108                     | 2.1                 |
| 2043 RCI Alternative 1- AM Peak | 111                     | 2.6                 |
| 2043 RCI Alternative 1- PM Peak | 134                     | 2.8                 |
| 2043 RCI Alternative 2- AM Peak | 95                      | 2.3                 |
| 2043 RCI Alternative 2- PM Peak | 119                     | 2.7                 |

**LEGEND**

- Grass
- Existing Pavement / Bridge
- Proposed Pavement
- Proposed Center Curb
- Proposed Mountable Truck Apron
- Proposed Bridge Approach
- Proposed Bridge Widening
- Proposed Deck Replacement



**U.S. 41 INTERSECTION IMPROVEMENTS  
RCI PROPOSED LAYOUT - ALT. 1 (Full Concept)**

INDIANA  
DEPARTMENT OF TRANSPORTATION

Not to Scale

# LEGEND

- Grass
- Existing Pavement / Bridge
- Proposed Pavement
- Proposed Center Curb
- Proposed Mountable Truck Apron



## U.S. 41 INTERSECTION IMPROVEMENTS RCI PROPOSED LAYOUT - ALT. 2 (Half Concept)

INDIANA  
DEPARTMENT OF TRANSPORTATION

Not to Scale

**PROJECT - US 41 & Elkhorn**  
**INDOT CONTRACT# R-41472**  
**INDOT DES # 1800224**  
**HNTB PROJECT # -- 74927**

Calculated By: JMA  
 Checked By: TNE

Date: 4/30/2020  
 Date: 5/1/2020

| <b>Alternative 1 - Full RCI Intersection</b> |                        | <b>Alternative 2 - Half RCI Intersection</b> |                        |
|----------------------------------------------|------------------------|----------------------------------------------|------------------------|
| Roadway Estimate                             | \$ 3,091,600.00        | Roadway Estimate                             | \$ 2,192,400.00        |
| Bridge Estimate                              | \$ 1,690,200.00        | Bridge Estimate                              | \$ -                   |
| <b>TOTAL</b>                                 | <b>\$ 4,781,800.00</b> | <b>TOTAL</b>                                 | <b>\$ 2,192,400.00</b> |

**PROJECT - US 41 & Elkhorn**  
**INDOT CONTRACT# R-41472**  
**INDOT DES # 1800224**  
**HNTB PROJECT # -- 74927**

Calculated By: TNE  
Checked By: SC

Date: 4/30/2020  
Date: 4/30/2020

**SB Bridge widening**

2195 SF widening to median  
\$ 180.00 / SF for widening  
\$ **395,100.00 Subtotal 1**

**NB Bridge widening**

2195 SF widening to median  
3050 SF widening to outside  
\$ 180.00 / SF for widening  
\$ **944,100.00 Subtotal 2**

**NB remaining Superstructure replace**

2925 SF Deck replacement  
\$ 120.00 / SF for deck replacement  
\$ **351,000.00 Subtotal 3**

\$ **1,690,200.00 TOTAL**

**Land and Water Conservation Fund (LWCF) County Property List for Indiana (Last Updated July 2020)**

| ProjectNumber | SubProjectCode | County | Property                |
|---------------|----------------|--------|-------------------------|
| 1800197       | 1800197        | Knox   | Four Lakes Park         |
| 1800278       | 1800278        | Knox   | Sandborn Community Park |
| 1800344       | 1800344        | Knox   | Ouabache Trails Park    |
| 1800589       | 1800589        | Knox   | Fox Ridge Nature Park   |

\*Park names may have changed. If acquisition of publically owned land or impacts to publically owned land is anticipated, coordination with IDNR, Division of Outdoor Recreation, should occur.